



PATAPSCO GREENWAY STUDY

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INTRODUCTION

In 1987 the President's Commission on American Outdoors sounded a call for creation of a nationwide system of greenways: "We have a vision for allowing every American access to the natural world: Greenways. Greenways are fingers of green that reach out from and around and through communities all across America, created by local action. They will connect parks and forests and scenic countrysides, public and private, in recreation corridors for hiking, jogging, wildlife movement, horse and bicycle riding. If the creativity and enthusiasm and love of the land of Americans are truly unleashed, greenways will link our communities coast to coast, from sea to shining sea."

The backbone for the Maryland greenway network was established around the turn of the century by the Olmsted Brothers who were pioneer landscape architects in Baltimore. The Olmsteds had the foresight to see the value in preserving stream valleys not only for the unique recreational opportunities they provided but also for the protection of waterways and natural resources. In their study of Baltimore, the Olmsted brothers noted the value of the variety of landscapes in the area - estuary, stream valley, open upland, and forested upland for their beauty and contrast. They observed the process whereby many precious natural landscapes are destroyed: scenic environments attract residential and business development, but development has the potential to obliterate the very picturesque quality that attracted them in the first place. The Olmsteds proposed that special legislation be enacted, providing for setbacks and easements to protect the scenic quality of these areas, as well as the water quality of streams, lakes, and reservoirs.

The Olmsted brothers recognized the importance of roadway and waterway networks to development and to meeting social needs. They saw that the placement of buildings and roads must be done in a way that promotes, and doesn't interfere with, the function of each, and that the systems should connect interrelated services and eliminate conflicting relationships. The Olmsteds also saw parks as serving many different purposes - playgrounds, exercise, grounds for small children, athletic fields, social recreation, promenades, neighborly gatherings, enjoyment of outdoor beauty, enjoyment of formal design, and enjoyment of nature. They saw the need for urban parks, rural parks, and parkways for driving, walking or riding, to connect and extend the parks to the people. Just as the placement of roads and buildings must be done in a system that promotes convenient use, parks satisfying different needs must be planned where they will best serve their intended functions and can be accessible through convenient connection. The Olmsted plan proposed a system of interconnected parks throughout Baltimore, making the different parks accessible to all, not just those immediately adjacent to them.

The concepts envisioned by the Olmsted Brothers gained popularity, and local, state, and federal government began to recognize the value and need for such an approach. In 1930, the Capper-Crampton act was initiated, making available federal funds on a cost-sharing basis for land acquisition along stream corridors in the Washington metropolitan region. At the same time, the Maryland-National Capital Park and Planning Commission (M-NCPPC) was created by the Maryland General Assembly, with part of its charter being to develop a plan to protect stream valleys. The M-NCPPC was charged with preparation, adoption, and amendment of

the general plan for physical development of the Maryland-Washington Regional District and the acquisition development, operation, and maintenance of public park systems. Over the years, federal, state, and county agencies have continued to put in place public land acquisition programs that have laid the framework for Maryland's statewide greenway system.

In March of 1990, the Governor formally announced the Maryland Greenways Program, and a Greenways Commission was established. Its charge was to analyze the feasibility of integrating a new system of interconnecting recreational trails and wildlife corridors to the existing framework of protective buffers along Maryland's waterways. These greenways would be corridors of open space that follow streams, ridgetops, rivers or other linear features for recreation and conservation purposes. The Patapsco Greenway was chosen as a model project for the greenway effort because it contains an example of almost every imaginable issue and opportunity that could occur in a greenway.

The Patapsco Greenway Study is the first step in the process to coordinate efforts for the implementation of a comprehensive greenway plan for the Patapsco River Valley. It serves to introduce state, local, and private greenway initiatives, proposed and potential greenway projects, and projects already underway. The study will serve as a tool to the state, associated counties, municipalities and private enterprise, for the development of greenway plans and coordination of efforts by providing information on resources, environmental legislation and regulation, and methods of implementing greenways. The study also lays the groundwork for a more detailed analysis and the development of greenway expansion alternatives. This will be a cooperative effort between the Maryland Greenways Commission, state agencies including the Department of Natural Resources (DNR), Maryland Department of Transportation, Maryland Office of Planning, and the local jurisdictions. A Patapsco Greenway Advisory Committee is being formed by DNR, and includes representatives from state and local planning agencies, as well as interested citizens of the area. This advisory committee will help establish goals for the Patapsco River Valley and the greenway, and will assist and guide planning efforts. Input and participation from the general public will be encouraged through open forums and public meetings. The development of a greenway plan can provide a common framework for complementary and cooperative projects for public and private land in the Patapsco Valley.

Some preliminary goals which have been identified for the Patapsco Greenway are to:

- Provide long-term environmental benefits particularly to water quality, riparian and other wildlife populations and habitat;
- Improve the area's scenic quality;
- Provide increased recreation alternatives;
- ♦ Establish attractive transportation links between BWI, the Inner Harbor, Annapolis, and the Patapsco River Valley;
- Increase tourism;
- Encourage business opportunities compatible with the overall greenway concept;

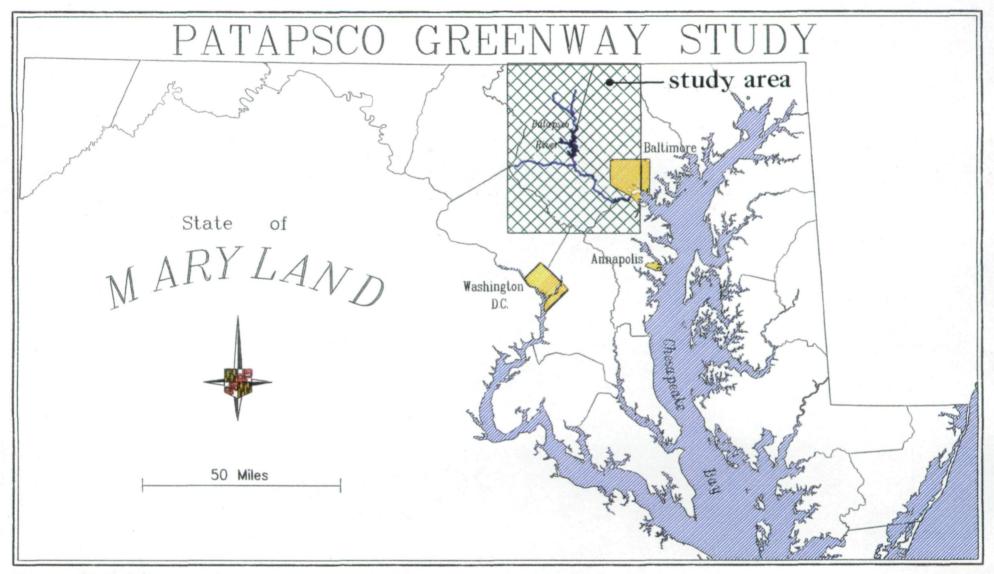
 Create a local constituency committed to the long-term conservation of the Patapsco and related greenway resources;

Phase II of the Patapsco Greenway Study will further define and specify the goals and objectives for a greenway in the Patapsco River Valley by building on the information identified in this report. The advisory committee will develop a format and materials for a charette that will include a variety of local representatives. The purpose of the charette will be to refine the goals established by the advisory committee and to establish an action plan. The action plan will include specific projects to be undertaken.

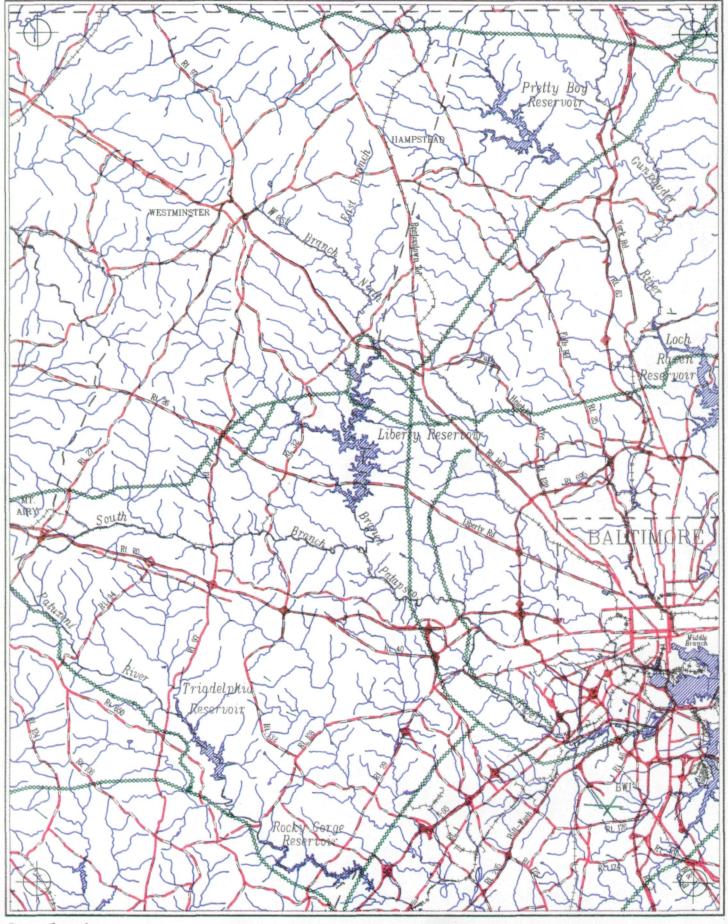
The area of focus for the Patapsco Greenway Study is comprised of public and private lands in Baltimore City, and Baltimore, Anne Arundel, Carroll, and Howard Counties (see map 1). The study window extends a square area just beyond the headwaters of all branches of the Patapsco and shows how the Patapsco can tie into adjacent greenway networks. Within this area is the Patapsco watershed, studied as a unit for purposes of water quality and environmental regulation. A major greenway will most likely be created along the corridors of the mainstems of the river and networked with smaller local greenways.

Presently, there are several large and well-established parks and open space areas in the Patapsco watershed which are in close proximity to one another. Included in these tracts are recreational, scenic, biological, geological, hydrological, and historical features worthy of protection. The value of these as useful public assets will be greatly enhanced by their connection.

A greenway in the Patapsco valley can link together the Gwynns Falls/Leakin Park system, Middle Branch, the Inner Harbor, Oriole Park at Camden Yards, the B & A hiker/biker trail, and ultimately the Patuxent River Greenway system. The creation of a Patapsco Greenway and its connections would provide the public with an off-road recreational/ecological/historical system of approximately 200 miles with environmental, educational, and economic benefits to the state.



Location Map



Study Area

PATAPSCO GREENWAY STUDY Legend

STREAMS

PRIMARY ROADS

SECONDARY ROADS

RAILROADS

POWER LINES

COUNTY BOUNDARIES

AIRPORTS/LANDING STRIPS

WATER

Protected Lands

DNR PROPERTIES

COUNTY/MUNICIPAL PARKS

MARYLAND ENVIRONMENTAL TRUST EASEMENTS

AGRICULTURAL EASEMENTS

RESERVOIR LANDS

Data Sources:

Base Map - U.S.G.S. Digital Line Graphs
(Scale 1:100,000)

Protected Lands overlay - DNR Public Lands
and Coastal Resources Division maps,
Dept. of Assessments and Taxation maps
1990 Land Use/Land Cover overlays Maryland Office of Planning

Land Use/Land Cover

INSTITUTIONAL

COMMERCIAL

LARGE LOT SUBDIVISIONS (AGRICULTURE)

LARGE LOT SUBDIVISIONS (FOREST)

LOW DENSITY RESIDENTIAL

MED. DENSITY RESIDENTIAL

HIGH DENSITY RESIDENTIAL

INDUSTRIAL

EXTRACTIVE (MINING, SAND & GRAVEL PITS, QUARRIES)

OPEN URBAN LAND

AGRICULTURE (CROPLAND, PASTURES, FEEDING OPERATIONS & FACILITIES)

DECIDUOUS/MIXED FOREST

EVERGREEN FOREST

BRUSH

WETLANDS

BEACHES, BARE GROUND & EXPOSED ROCK

PATAPSCO REGIONAL INVENTORY

This first phase of the Patapsco Greenway Study has involved research and compilation of data on existing resources within the study area, as well as identification of the state and local plans and programs already in place to protect them. Through maps, computer data, field visits, aerial photos, master plans, and communication with local government agencies, information has been assembled on the natural and man-made conditions which exist in the Patapsco Valley, as well as the plans and goals embodied in the jurisdictional open space plans and land use and environmental regulations. This information is instrumental to an understanding of the area and will be an essential tool for future planning and implementation of the greenway. The Department of Natural Resources, Greenways and Resource Planning Program will be working with the counties and interest groups to update and add increasing detail to the study to further inform all parties and to promote the coordination of efforts. As information is compiled, analysis as to the implications of the existing conditions and their impact on the direction of the greenway will be used in the regional planning of the greenway, as well as in local and site-specific planning.



RESOURCE INVENTORY

In order to study the potential for greenways in the Patapsco River Valley, an inventory and assessment of existing features is the first step. The Department of Natural Resources (DNR) has compiled information on the natural and man-made elements that comprise the region, to examine where important greenway components are already protected and to determine the feasibility of initiatives to expand and protect greenways in additional areas. As the study progresses and recommendations are made, each of these aspects will be examined in greater detail, with the benefit of more site-specific and detailed information, to determine the appropriateness of each proposal.

Inventory data has been compiled in a Geographic Information System (GIS). This allows information gathered from a number of sources to be studied and mapped separately or together. The acetate overlays inserted in the rear pocket are maps of some of the aspects studied for the Patapsco. These layers superimposed over the base allow for simultaneous analysis of several characteristics of the region and the relationships between them. The resource maps inserted in the text are composites of the base map and resource information.

The study area is a 1,420 square mile (919,777 acre) area which extends to the limits of the Patapsco River. (See Figures 1 & 2) The area includes Mount Airy at the beginning of the South Branch, Westminster at the headwaters of the West Branch, Manchester and Hampstead at the northernmost end of the East Branch, and Baltimore at the mouth of Middle Branch Patapsco. It includes the Patapsco River watershed as well as neighboring rivers and greenways, as the Patapsco Greenway is part of a network of greenways envisioned for the State. The study looks at how these neighboring greenways might link to the Patapsco Greenway.

NATURAL AND CULTURAL RESOURCES

This section describes the important resources in the Patapsco River corridor, as well as the ways in which some of these are now being conserved, and the human activities in the watershed which can affect these resources and future greenway protection or use. The interaction of human uses and social needs with the valued natural and cultural resources of the region will shape planning and future development of a greenway along the Patapsco.

Topography and Geology

The Patapsco River lies in two physiographic regions: the Coastal Plain and the Piedmont. The westernmost sections of the river are located in the Piedmont, characterized by high elevation, knobs, ridges, and an undulating topography, metamorphic rock substructure and numerous stream valleys. The soils are productive, and much of the area is devoted to agriculture.

The fall line transects the region just north of, and almost parallel, to the line between Anne Arundel County and Howard and Baltimore Counties. From here east the Patapsco flows through the Coastal Plain out to the Chesapeake Bay. The topography is rolling upland to relatively flat terrain, and the soils are composed of more clay, silt and sand, unconsolidated marine deposits, and sediments eroded from the Appalachian mountains. Agriculture, forest and urban uses are mixed throughout the region.

The Department of Natural Resources has obtained digital topographic information for use in slope analysis of the river corridors. This will be important in refining the understanding of the character of the landscape. It will also assist in determining where particular greenway uses might be appropriate and what design considerations will be important for the location and construction of facilities.

Water Resources

The Patapsco River drains an extensive area of the Piedmont Province in central Maryland. Its headwater springs and seeps converge to form high gradient streams flowing through steep-sided ravines. As these join, the streams become a river, with lower gradient and more sluggish flow, and a floodplain of increasing width, until, when it passes the fall line and enters the Atlantic Coastal Plain near Elkridge, the Patapsco is wide and slow moving. These changes in gradient and flow provide dramatically varied habitat for a wide variety of terrestrial and aquatic species. The rivers and streams form the spine of greenway systems by providing linear open space reaching out through the region, tieing together many different environments and communities.

The Patapsco River watershed is characterized by an extensive network of streams and small man-made lakes, creating a multitude of opportunities for protection and enhancement. The watershed covers an area of approximately 375,000 acres. (See Figure 4) The South Branch and mainstem of the Patapsco flow about 85 miles from Parr's Spring to the Middle Branch. The North Branch, formed at the confluence of the East Branch and West Branch, flows through Liberty Reservoir, a major component of Baltimore City's water supply, before joining the South Branch not far from the Town of Sykesville. After flowing through Baltimore Harbor, the Patapsco River discharges into the Chesapeake Bay. Tidal waters of the Patapsco River extend from the Baltimore Harbor through the Seven Ponds area to the Baltimore Beltway (Interstate 695).

The water quality of the Patapsco is dependant on the quality of the smaller streams that feed it. Pollutants entering the tributaries will be passed on to the Patapsco and to the Chesapeake Bay. Therefore, it is important to protect the feeder streams and tributaries as well as the larger rivers.

Several of the rivers and streams in the study area are not within the Patapsco watershed but are important for connecting the Patapsco River greenways to those in other major river systems, such as the Patuxent and the Gunpowder. Gunpowder system streams and lakes that have been mapped include Piney Run, Slade Run, Peggy's Run, Western Run, Blackrock Run, McGill Run, Councilman's Run and Beaverdam Run, and the Pretty Boy and Loch Raven Reservoirs. Patuxent system

water features shown in the study area are the Little Patuxent and Middle Patuxent Rivers, Cattail Creek and Cabin Branch.

All of Maryland's rivers and streams are classified according to the uses and have specific water quality controls. From time to time, these use classes may be reviewed and revised as additional information is obtained, particularly information on fish species found in the streams. Three use classes of streams are found in the Patapsco basin: Class I streams are protected for body contact recreation and warm water fishery uses; Class III streams are natural trout waters and Class IV streams will support trout populations during much of the year, although they become too warm for trout during the summer. Such streams in the Patapsco are stocked for "put and take" fishing by DNR.

The Patapsco system streams listed below and mapped in Figure 2 are all Class I streams unless noted otherwise:

Patapsco River

South Branch Patapsco--Class IV North Branch Patapsco, above Route 140--Class IV

being considered for III

East Branch--Class IV

being considered for III

West Branch--Class IV

being considered for III

Falls Run

Locust Run--Class I

being considered for III

Cooks Branch

Morgan Run--Class III

Piney Run--Class IV

Hay Meadow Branch

Gillis Falls

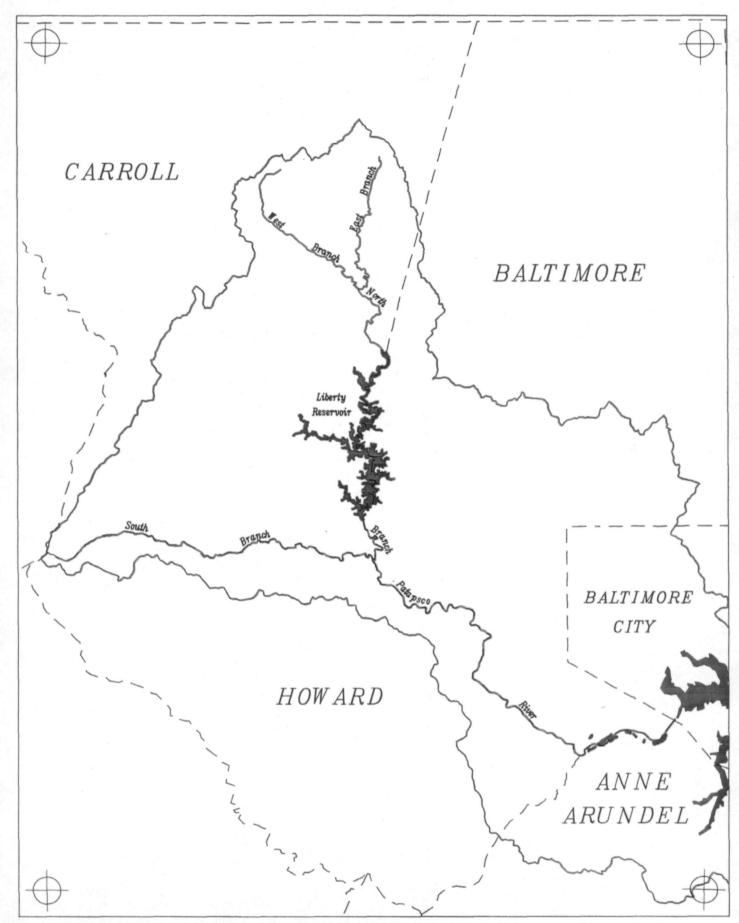
Deep Run Sawmill Creek Stony Run Soapstone Branch Middle Branch Cooper Branch Ben's Run--Class I being considered for III Brice's Run--III Dogwood Run Jones Falls--Class III above Lake Roland Gwynns Falls--Class III above Route 140 Red Run Horsehead Branch Scotts Branch Norris Run - Class III

Class III and IV streams, because they support significant fishery resources, may be deserving of particular attention for greenway creation and protection, both because of the importance of the resources and because the fishery offers significant recreational potential.

Wetlands

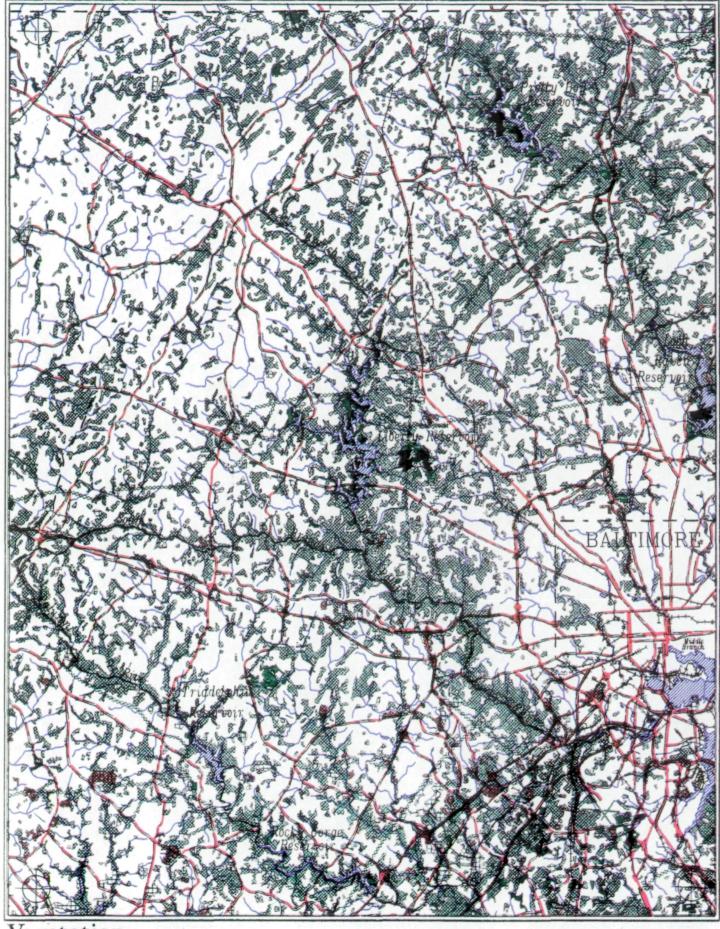
While the greatest concentration of wetlands in the Patapsco watershed is along the lower end of the river, pockets of wetlands exist all along the stream and in areas of the tributaries and lakes. A diversity of wetlands exist, including tidal and nontidal, forested and exposed, and riverine and estuarine.

At least ten wetlands of special state concern are in the Patapsco watershed. These are wetland sites with exceptional ecological and educational value, often containing rare and endangered species. In the Patapsco, these include rare plants of forested and non-forested habitats, rare butterflies, and rare and aquatic beetles.



Watershed Boundary

Figure 4



Vegetation

Figure 5

Rare mature Pitch Pine-Red Maple Swamp forests border Stony Run and are blanketed by native wildflowers.

Wetlands of Special State Concern are designated for special protection under the State's wetlands regulations. Regulations restrict clearing, filling or development of these wetlands, and forestry, sometimes permitted in wetlands, is regulated within these areas.

Regulations set criteria for best management practices within primary and secondary protection areas surrounding these wetlands. Primary protection areas include any area which is required to avoid knowingly violating federal and state endangered species laws. Secondary protection areas include any area with obvious direct and significant hydrologic connection to the primary protection area, or 300 feet, whichever is greater. These protection areas and the practices allowed within them are further defined by the nature of the species being protected.

Vegetation

Twenty-eight percent (28%) of the Patapsco watershed is forested. Forest cover is mostly hardwood forest with occasional pine forests intermingled. Concentrations of trees occur along many of the streams and lakes but are also interspersed throughout the watershed. (See Figure 5) The watershed region is fortunate to have such large forested areas, and many of the stream valleys and ridgetops that would be vital greenway links contain beautiful mature forests. Species include red oak, white oak, chestnut oak, tulip poplar, dogwood, black gum, chestnut,

cedar, virginia pine, red maple, ash, black walnut, beech, spicebush, viburnum, mountain laurel, and various ferns.

Forest cover is important for ecological as well as scenic quality. Forests reduce soil erosion, provide wildlife habitat, absorb and purify rainwater for infiltration and groundwater recharge, reduce noise and air pollution, and supply oxygen and other valuable nutrients to the air and soil. Benefits to developing areas include lumber and wood products, moderation of temperatures and wind, recreation, and visual interest.

The nature of the vegetation in an area will also be a leading indicator of other environmental conditions such as soil type, moisture and temperature, acidity and salinity, and will be a factor in deciding how the area will be used. Areas which are often saturated will not be suitable for active recreation but may be important to protect for wildlife habitat, flood management and visual interest. Some dense pine forests present difficulties for trail location, whereas deciduous forests provide excellent opportunities. The nature and density of tree growth and undergrowth can also affect how an area will be used.

Fish and Wildlife

The Patapsco has changed greatly over the past few hundred years. Much of the woodland that once protected its pristine headwaters has been cut to provide for agricultural production or urban development, resulting in increased water temperatures and pollutant loads. In addition, dams were built to block the river, and waste was dumped from adjacent municipalities and factories. These historic changes made portions of the drainage area unacceptable to many native aquatic species. However, the aquatic community is still relatively healthy in many stretches, and few, if any, species have been completely extirpated from the Patapsco River. A significant sport and recreational fishery still exists, with white perch, blue crabs and the occasional striped bass and bluefish showing up at the mouth, catfish, smallmouth bass and bluegills providing sport fishing in the middle reaches, and trout being the desired catch in some upper headwaters.

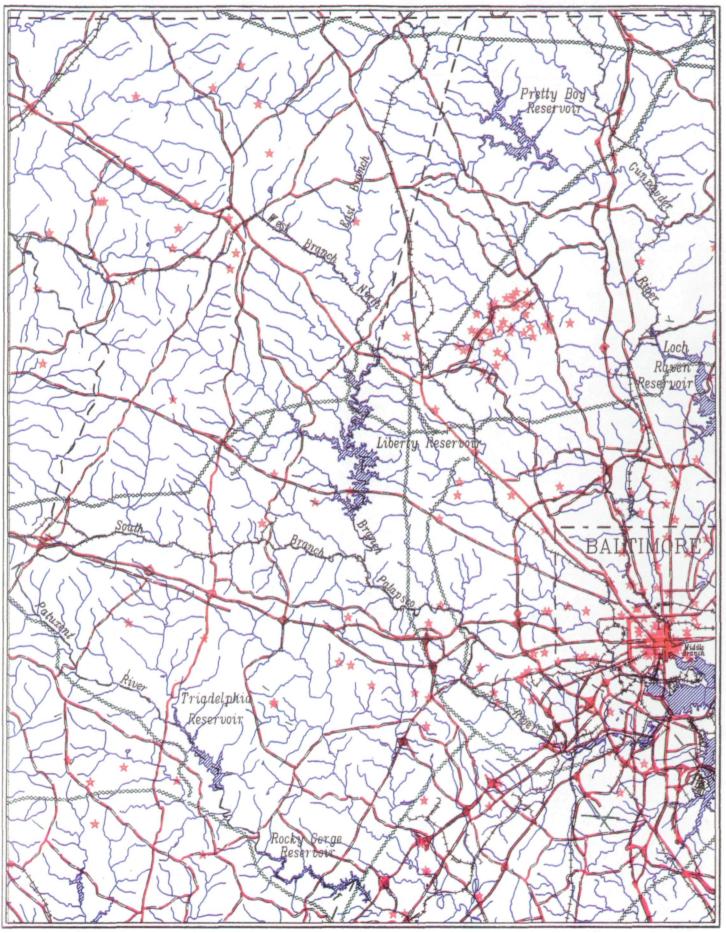
In recent years naturally reproducing brown trout have been found in the East Branch and North Branch, leading state fisheries biologists to request that these streams be reclassified. Because some modification of land use practices could be undertaken to improve fish habitat in the West Branch, reclassification of that stream is being requested also. Elevated summer temperatures which could be alleviated by establishing or maintaining forested buffers, is the primary factor affecting fish habitat in headwater areas.

Efforts are under way to return other parts of the Patapsco to their original productivity. Of particular importance are programs to eliminate pollution from municipal and industrial outfalls discharging into the river and the removal of dams and other blockages that presently close large sections of the mainstem to the movement of important catadromous and anadromous migrants such as the American eel, both species of shad, and the striped bass. A major inter-agency cooperative restoration program was developed in response to the 1987 Chesapeake Bay

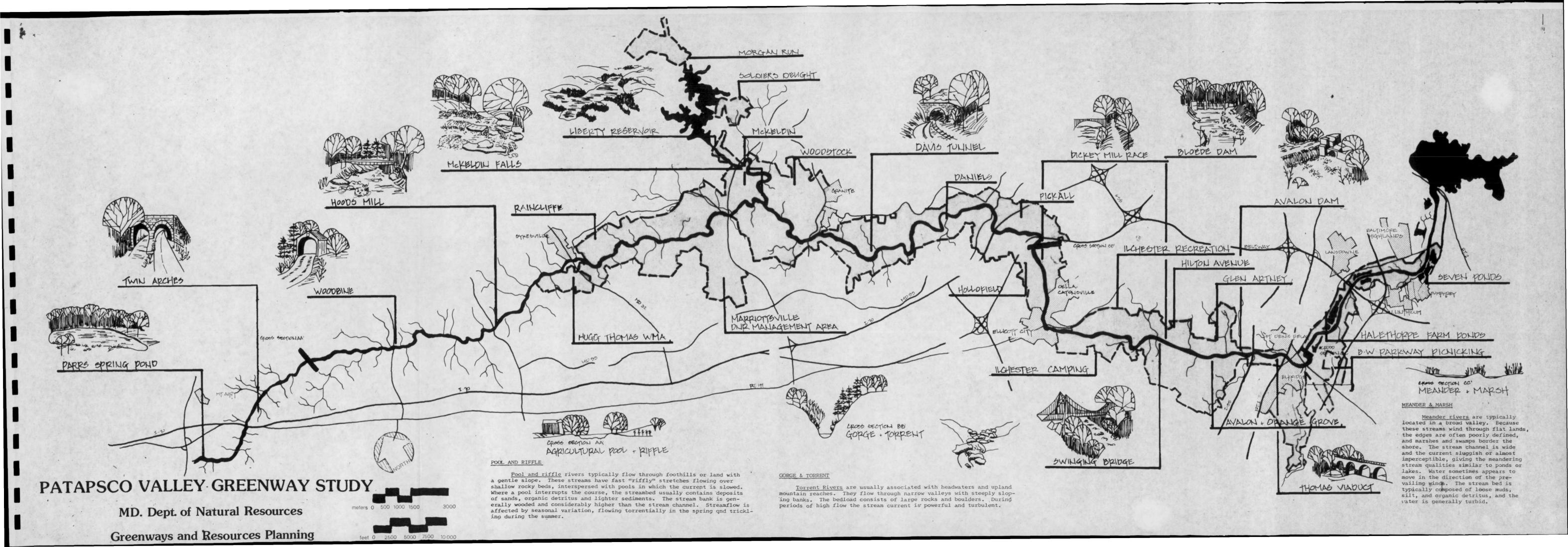
Agreement which targeted seven blockages on the Patapsco, Stony Run and Deep Run. Work to remove these blockages or to provide fish ladders is well under way. As these programs advance, and changes in land use reduce pollutant loading from non-point sources, there is every expectation that the Patapsco will regain its past productivity. With hard work and dedication striped bass will once again be caught in the river near Avalon.

The terrestrial community of the Patapsco River Valley is also varied and diverse. However, as the watershed was cleared and extensive areas of forest were converted to other uses, many of the indigenous plant and wildlife species became increasingly restricted to shrinking wooded areas, typically along the water courses. Today the Patapsco valley still supports most of the wildlife species that typically occur within this region of Maryland. Although a good number of these, such as rabbits, raccoons, possums and other small mammals thrive in open areas of mixed agricultural/residential development, others, such as deer, are more closely associated with the remaining woodland (or at least its edges). Some (otters, mink, many species of songbirds, etc.) are closely associated with these wooded tracts and can be expected to disappear if the remaining large forested areas are lost.

Some important species, the forestinterior dwelling species (FIDS), for instance, are declining throughout this region as undisturbed forest is converted to other uses, and face ultimate extinction if land use patterns are not changed to provide sufficiently large, undisturbed tracts of woodland. It is significant that



Historic Sites



some of the finest remaining wooded tracts within this drainage area are contained within the Patapsco Valley State Park, providing vital habitat for local wildlife, as well as opportunities for the public to observe and learn about these species. If the forest were fragmented into parcels less than 100 acres with 300 foot edge buffers, species affected would include songbirds and birds of prey, like the red-shouldered hawk and barred owl, as well as mammals such as those described above.

Although most human interaction with wildlife involves these more abundant and easily observed species, the Patapsco River Valley also supports populations of numerous others that the average visitor never sees. For instance, temporary ponds along the floodplain provide breeding sites for such interesting species as marbled and spotted salamanders, a variety of tree frogs and other amphibians that sing their songs undisturbed in the night. On rocky ledges along the steep hillsides, copperheads, black-rat and milk snakes, and other reptiles gather to sun themselves in spring and fall, and hibernate during winter. Such denning aggregations have become rare in the surrounding area but still exist abundantly in the wilder regions of this river valley.

Considering this, it should not be a surprise to learn that some very rare plants and animals are occasionally noted there. One such occurrence was a single timber rattlesnake recently found near the Patapsco. This snake was once found throughout this region but has been eliminated almost everywhere east of the Catoctin Mountains. Knowing that such interesting creatures still exist this close to Baltimore illustrates the importance of the

Patapsco River Valley to wildlife and underscores the wealth of opportunity it provides for people to experience and learn more about the native plants and animals of our State.

Greenways support and enhance the quality of the habitat and diversity of wildlife through protection of stream valley corridors and wildlife corridors.

Cultural, Historic and Archaeological Sites

The Patapsco Region is rich in historic and cultural heritage. Two hundred fifty-four National Historic Standing Structures have been located in the study area using data from the Maryland Historical Trust. (See Figure 6) Designation as a National Historic Site or District affords some degree of protection to important cultural resources. DNR is in the process of assembling more information on these sites for use in planning and preservation, as well as education.

Discovered in 1608 by Captain John Smith, the Patapsco River has seen much history. Tobacco was transported over land to Elkridge Landing, one of the earliest eastern seaports. Avalon's iron furnaces and forges produced guns for Washington's Revolutionary Army. Structures such as 17th and 18th century flour mills, ironworks, and viaducts, as well as prehistoric features dot the landscape and give added depth and texture to one's understanding of the area. Bloede Dam was the first internally housed power plant. Thomas Viaduct, the world's first multi-arched stone railroad bridge, still carries trains today. By preserving these landmarks, the history and culture of the

region, is preserved and can be passed on to future generations. In understanding their ancestors' connection to the land, future generations can better understand their own. The remaining structures tell of days of hardworking miners, of fabric mills, of the first railroad, of colleges and places of worship, of days when the Patapsco River was not only a source of beauty and recreation, but provided critical transport and livelihood.

These historic sites can be made more accessible to the public through restoration and inclusion in greenway networks. This is already occurring in the Elkridge Landing and Oella-Ellicott City areas in the Patapsco Valley. By planning trails or bikeways that tie into these sites, their history becomes a part of the recreational experience. It is evident from the map that historic structures in the study area are clustered in Baltimore City and in the area surrounding Dover, at the convergence of McGill Run, Western Run, Slade Run and Councilman's Run. The more isolated sites may particularly be enhanced by connection through greenways to other educational, cultural and natural resources.

PROTECTED LANDS IN THE PATAPSCO CORRIDOR

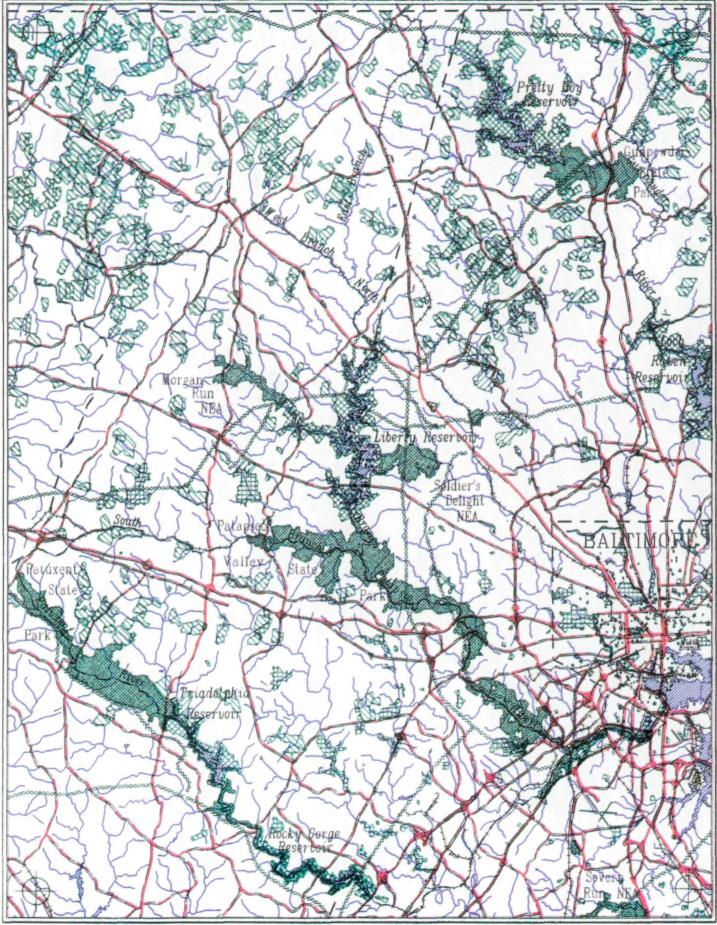
Important resources can be conserved through a variety of mechanisms, from purely voluntary efforts of private property owners, by selling or giving easements to a public or private conservation organization, to outright public ownership. Historically, public ownership has been the primary method of protecting lands in greenways. For this reason Figure 8 contains primarily publicly owned land. Some lands protected by easement are also shown;

however no purely private, voluntarily protected properties have been identified in the corridor at this time.

State Owned Properties

DNR is owner of nearly 16,800 acres of land along the Patapsco River and its major tributaries. Most of this land is part of the Patapsco Valley State Park; lesser acreage is owned by DNR in the Morgan Run Natural Environment Area, Hugg Thomas Wildlife Management Area and Soldiers Delight Natural Environment Area. Together these properties conserve land along nearly 30 miles of the South Branch and mainstem of the river. (These properties are described in more detail under "State Land Management in the Patapsco.")

The State of Maryland also owns other significant properties that may be valuable in enhancing the greenway, although they are not currently managed for open space or land conservation purposes. These are large tracts that involve substantial open space or natural areas situated in the corridor, which could provide important greenway links. They may offer opportunities for education or recreation, or may be centers for people likely to use greenways. Baltimore-Washington International Airport, the University of Maryland Baltimore County, Rosewood State Center, Spring Grove State Hospital Center, Maryland Military Academy, and Springfield Hospital Center, are all areas which may provide greenway connection opportunities.



Protected Lands

Figure 8

County/Municipal Parks and Properties

Local park systems make up an important part of the greenways network. (Local parks are mapped in Figures 8 and 11.) The City of Baltimore has been very active in developing parks and greenways and in reclaiming areas that had become degraded by neglect or negative effects of urbanization. Howard County has an extensive system which includes neighborhood parks as well as regional parks and environmental areas. Parks and trails developed in Mount Airy, Sykesville, and Carroll, Baltimore and Anne Arundel Counties are vital to conservation and recreation in these areas and provide important greenway elements. These areas provide wildlife refuge, protect water quality and provide recreational opportunities such as trails, ballfields and picnicking. Places designated for active recreation fulfill important social needs as well as help to concentrate activity away from more sensitive areas that need protection and preservation. Many sensitive areas such as stream buffers and floodplains have been dedicated to local governments for care and protection. In addition to addressing local needs, these county lands may provide links in regional or statewide greenways.

Private Conservation Lands

The Maryland Department of Natural Resources is in the process of compiling information on private conservation lands within the Patapsco study area. These are lands privately owned by either individuals, corporations or non-profit organizations which have been designated as conservation areas, limiting the uses permitted on the property. Often through

philanthropic organizations, or life estates, lands have been set aside to protect wildlife corridors, certain species, or natural areas that the owner does not want to see spoiled. Privately conserved lands, even when not available for public access, can often be important links in a continuous network of open space. Recognizing these properties and their purpose, planners can respect and promote the goals of property owners and the public alike, adding conservation lands around them or planning active recreation away from them. At this point, no privately conserved lands have been identified within the study area.

Lands Protected by Conservation and Agricultural Easements

Lands protected under easements held by the Maryland Environmental Trust (MET) and Maryland Land Preservation Foundation play a role in the character of the watershed. These easements protect farm and forest land, wildlife habitat and scenic and historic sites. By donating conservation easement on land to MET, or placing land in an agricultural preservation district, the owner maintains all ownership rights except the right to develop the property. Because development does not occur on lands under easements, a part of the natural and cultural heritage of the state is preserved. While MET easements are generally in perpetuity, lands are placed in agricultural districts usually for five years, at which time the development rights may be sold to the Maryland Land Preservation Foundation. In the study area, most lands under easement are in the northern portion where farming is still practiced or little development has occurred. They are not around the main branches of the Patapsco,

but protect many of the areas fed by its tributaries. A concentration of these protected lands exists in the Piney Run and McGill Run watersheds. (See Figure 8) This area is one of the areas Baltimore County has designated for stream valley protection and greenway initiatives, as well as agricultural conservation. Currently, there are 28 MET easements in the Patapsco River watershed, totalling 1,455 acres.

Reservoir Lands

Five major reservoirs exist in the study area. (See Figure 2) Liberty Reservoir is the only one within the Patapsco watershed and is centrally located, just north of Patapsco Valley State Park. Over 6,000 acres of protective buffer surrounding nearly 3,000 acres of water on the Patapsco's North Branch. This reservoir is a major component of the Baltimore City water supply and supplies water to Carroll County as well. Prettyboy Reservoir and Loch Raven Reservoir are both on Gunpowder Falls but could be connected to the Patapsco by virtue of the stream and ridgetop greenways envisioned by Baltimore County. All three reservoirs are owned and operated by the City of Baltimore, and provide drinking water for the City and some of its surrounding suburbs.

Triadelphia and Rocky Gorge
Reservoirs are in the southwest corner of
the study area on the Patuxent River.
Owned by Washington Suburban Sanitary
Commission, they comprise approximately
6,000 acres of the Patuxent Greenway,
which could be linked to the Patapsco
Valley through several connectors proposed
by Howard County.

A smaller water supply reservoir is located on Piney Run in Carroll County just outside Sykesville. The county maintains a park on the lands surrounding this reservoir.

The lands surrounding the reservoirs are protected from development and, therefore, play a vital role in the preservation of water quality, natural resources and open space even when they are not managed for recreation. Their value as conservation and wildlife corridors underscores their scenic value.

Where feasible, paths may be constructed within these lands for connection with surrounding parks and greenways and for active enjoyment of the area's beauty. The reservoirs also offer opportunities for canoeing, boating, and fishing.

MAN-MADE SYSTEMS

While public agencies were acquiring and protecting lands along the Patapsco and its tributaries for conservation and recreation purposes, private development throughout the watershed was converting land from forest to agriculture or urban use, from agriculture to more intensive urban and suburban use and from low density to high density residential and mixed use. Growing apace, both shaping and shaped by the development of other uses, is an extensive transportation network. Much of this network cuts across important linear natural resources important to the greenways network. Some of the transportation network has obliterated greenway elements, as with the Jones Falls Expressway.



Land Use

Figure 9

In addition to impinging upon the natural landscape, human activities and artifacts generate demand for particular greenway uses. They may also offer opportunities to extend the greenway network, via scenic roads, utility corridors and public easements and could provide access to greenway elements. Careful planning can integrate the infrastructure necessary for human activity while at the same time protecting the integrity of the natural systems already in place.

Land Use

The ability to extend greenways in the Patapsco valley is clearly shaped by the other uses being made of the land in the corridor. Land available for greenway expansion will often be what is left after the development of other uses or from the conversion of one developed use to another.

Land uses in the region historically developed in response to the natural characteristics. Flat fertile lands were used for farming, and steep, poorly drained areas were left in forest; urban development occurred along the fall line, at ports, and in areas serving mining, agriculture and industry. While topography, soils, and hydrology still determine developability, and resources determine the location of many industries, recent development has also been greatly determined by the accessibility provided by transportation routes.

A study of land uses in the Patapsco region reveals that over half of the land in the watershed is in agriculture and open space. The City of Baltimore is predominately medium to high density

residential, with the most intense development around the Inner Harbor. Commercial and industrial uses are concentrated here and along major transportation arteries radiating out from the city, such as Reisterstown Road, Greenmount Avenue, York Road and Interstate 95. As evidenced in Figure 9, the most intense suburban development occurs in Columbia and in the portions of Anne Arundel and Baltimore Counties nearest to Baltimore, although the map also highlights more recent trends toward scattered development in outlying areas. These different types of development will dictate different greenway needs.

In some cases, future land development activities can contribute to the greenway network. Ways in which this can be accomplished are described in the chapter on implementing greenways. Needs of residents, employees and patrons of commercial or industrial establishments affect both the demand for recreational development in a greenway and the location of other supporting uses, like schools, which can usefully be linked to greenways. Planning for future land use will thus be an important component of greenway planning, particularly at the local level where special opportunities exist for coordinating these activities with the greenway network. Careful planning of greenways can set aside areas that are environmentally sensitive or important for open space, connection, wildlife corridors or recreational needs, and can layout networks in a logical pattern, thus preventing our open space from being only a collection of unrelated leftover parcels. This not only connects open areas for recreation links but allows for the health of natural systems and wildlife migration.

Concentration of human uses has often negatively affected the natural resources they relied on. Overuse, pollution from fertilizers, sanitary waste, industrial discharge, and runoff from urban roofs and streets have been depleting or damaging the quality of the air, water and mineral resources. Legislation enacted over the last 50 years has helped to control and remedy these negative impacts, primarily by controlling pollutants at the point they are discharged into the environment. Much more still needs to be done to alleviate problems of toxic metals and materials, stream siltation and reduced water quality for fish and wildlife, and poor air quality. Changes in land use planning and development of greenways are among the means being advanced to deal with these continuing problems.

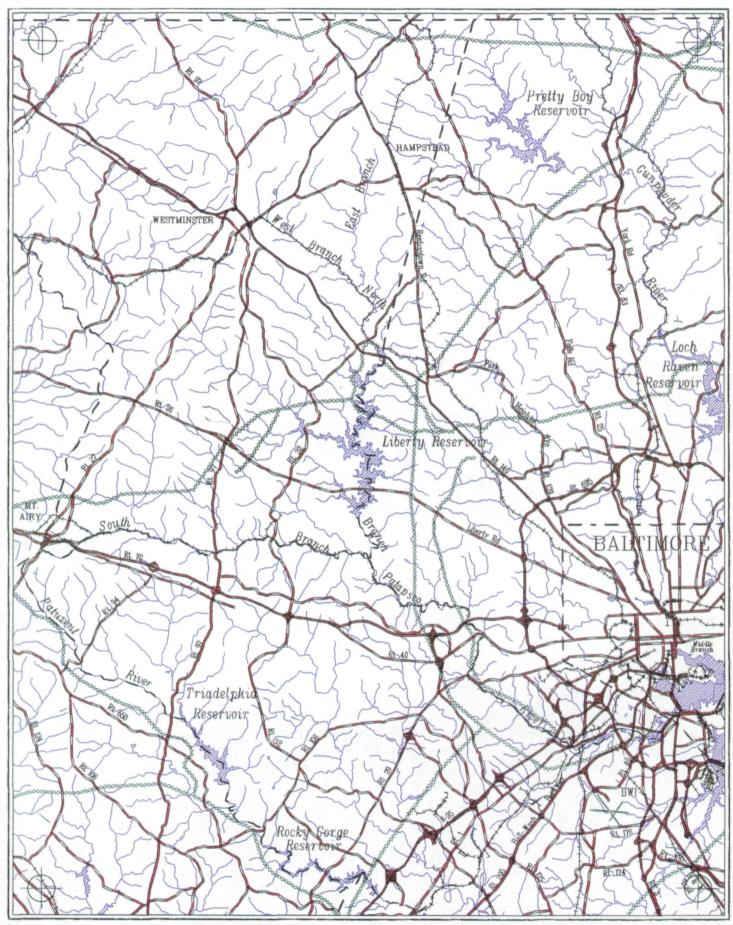
Transportation Networks

Transportation routes both determine and are determined by land uses in an area. They are the spines of development. Industrial uses have typically been developed around waterways and railroads necessary for the transport of goods and raw materials. Commercial and residential areas more typically developed around the road systems, and institutional uses are frequently concentrated at the core of the region they serve, to be centrally located and near associated public agencies, services and mass transportation. Transportation facilities are major consumers of land. Their impervious surfaces contribute to the stormwater runoff from which greenways often must buffer streams.

The development of a greenway plan must consider existing and planned

transportation networks for several reasons:

- Greenways and transportation corridors need to be planned together, to avoid having transportation routes cut important greenways. Where such cutting is unavoidable the transportation routes can be designed to facilitate passage for fish and wildlife, and in some cases people, along the greenway.
- ◆ Transportation networks must respond to existing land use. They are indicators of community needs and commuter patterns. They are also instrumental in shaping the patterns of development in an area.
- Greenways need to connect compatible land uses and avoid incompatible land uses. Transportation links can be planned to provide these links or to separate vehicular from non-vehicular traffic.
- Transportation networks often can be merged with greenways. Examples of such integration are scenic parkways, bikeways along existing road shoulders, rail trails and walking tours through historic streets.
- Greenways may provide alternatives to traditional modes of transportation:
 e.g., walkways and bikeways to work, shopping, schools, historic sites, entertainment, restaurants. Availability of services also enhances greenway opportunities.
- Greenways can connect people to transportation: busses, train and light rail stations, airports.



Transportation Networks

Figure 10

 Transportation networks provide access to greenways for those users not adjacent to them.

Major transportation networks have been developed in the Patapsco region, largely as a result of the growth of the metropolitan area of Baltimore and Washington, D.C. and the development of Baltimore-Washington International Airport (BWI). The Baltimore Beltway (I-695), Baltimore-Washington Parkway and Interstate 95 serve to connect the city to areas north and south. Route 70 is a main east-west artery, generally paralleling the Patapsco, linking Carroll, Howard, and Frederick counties to Baltimore, while Routes 29 and 95 are major north-south connectors between Baltimore and the Washington, D.C. area. Figure 10 demonstrates how major transit arteries have been superimposed on the natural landscape.

CSX Transportation operates a rail line along the South Branch of the Patapsco, between Mount Airy and the City of Baltimore. While active rail lines often represent a competing use, in some cases, these rail lines could potentially link greenways through shared corridors or conversion from rails to trails.

Baltimore is now served by the Central Light Rail Line (CLRL), a 13-mile long transit line running from Timonium through Baltimore to Camden Yards. The line is scheduled to be extended nine more miles to Dorsey Road, south of Baltimore and just east of the BWI Airport, by mid-1993. Extensions of the line are currently under construction, with state and local funds. Planned extensions to Hunt Valley, Penn Station and BWI airport will bring

the length of the line to approximately 29 miles. The Mass Transit Administration (MTA) requested federal participation in the evaluation of alternatives for extension of the light rail line into BWI. As studies and preliminary design work on the spurs continues, MTA is meeting with citizens, community groups, businesses and government agencies in the affected areas. The addition of a hiker/biker trail along the CLRL could connect the B&A Trail with the Northern Central Rail Trail.

Utility Corridors

Utility corridors provide both constraints and opportunities to the development of greenways. Often utility lines are protected by easements which prohibit the building of structures or planting of major trees, so that access for repair is insured and operation is not hampered. These easements, for electric power lines, stormwater management, water, natural gas, and sewer lines, create bands of open space within the fabric of urban or suburban development. These bands of open space can provide migration corridors for wildlife or paths for people. Careful attention must be paid, however, to issues of safety and liability in planning the activities or uses allowed in these areas.

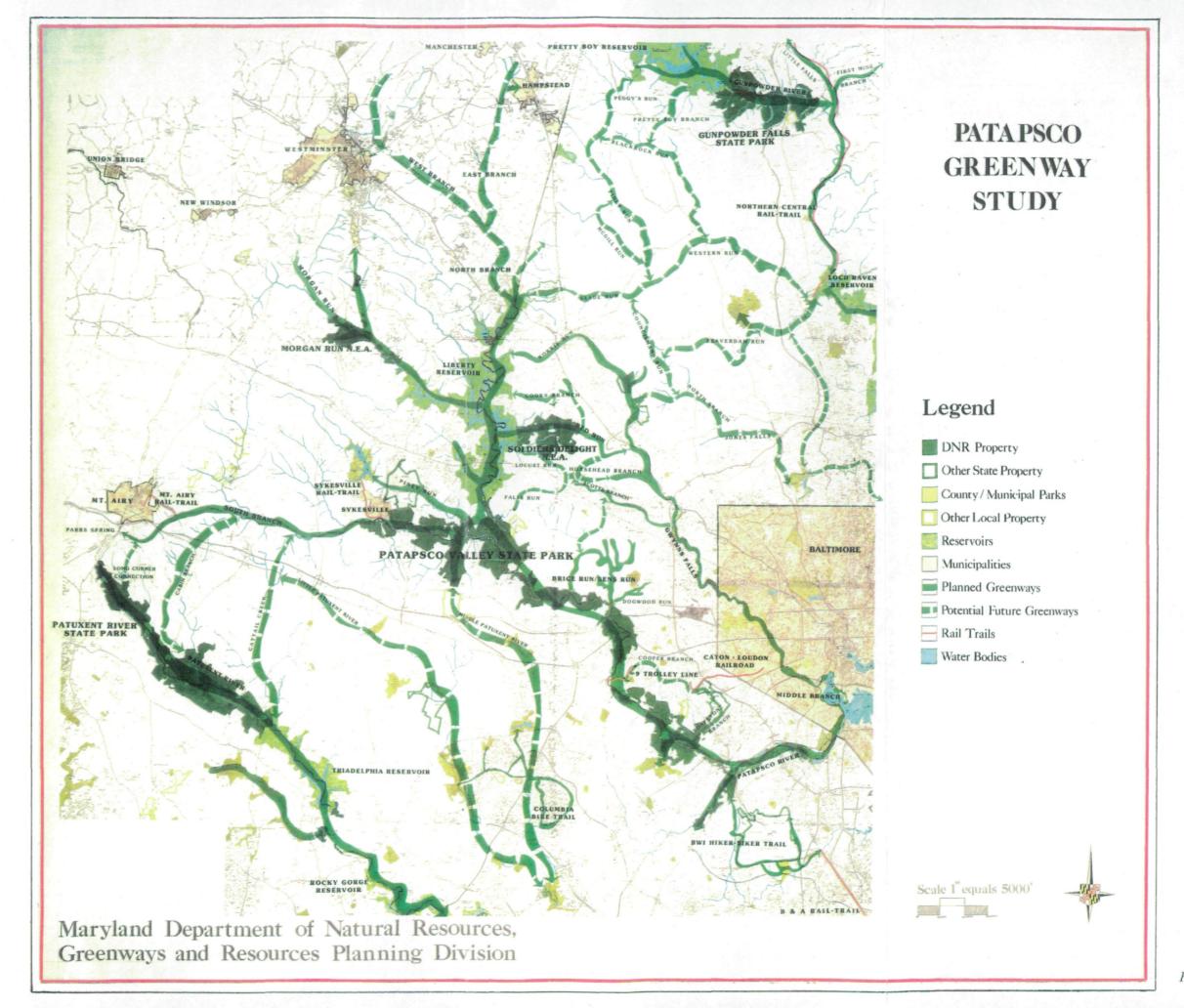
PLANS AND GOALS OF MAJOR GREENWAY PARTNERS

The Patapsco Greenway is unusual among Maryland's large greenways in a number of ways:

- o It has a significant State presence, in the form of Patapsco Valley State Park and several other Department of Natural Resources landholdings;
- o There is very little Federal involvement in land management activities, although Federal funding mechanisms have been employed by other greenways partners;
- o There has, until now, been little involvement of private land conservation organizations in the protection of lands in the Patapsco corridor, although there are conservation and agricultural easements on properties along the Patapsco and its tributaries.

The major partners in creation of the Patapsco greenway, to date at least, have thus been the State of Maryland, primarily the Department of Natural Resources and, to a lesser extent, the Department of Transportation and the local governments of the region--Baltimore City and Anne Arundel, Baltimore, Carroll and Howard Counties. The Towns of Mt. Airy and Sykesville have become more recently active in greenway creation. The existing plans and programs of these agencies with respect to greenway component properties are outlined below. Many innovative projects have been introduced, and important greenway linkages are already being created. By examining the plans and goals of various parties in the greenway effort and seeing how they relate to on another, commonalities can be found that will help shape the plans and chart the course of action for a regional greenway system. Other means by which these participants can help to create the greenway are described in the next section.

Private landowners have also done much to preserve the character and quality of the area, as well as to coordinate concerted efforts to protect certain greenways. Helping to pull the governmental players together, initially, and providing a mechanism to help draw in more private sector participants is the goal of the Maryland Greenways Commission. In its 1990 report to the Governor describing the feasibility of a statewide greenways network, the Commission urged immediate attention to creation of a Patapsco Greenway as a model for the rest of the State. This report is a response to that mandate and is the first step toward development of a greenway plan for the Patapsco.



STATE LAND MANAGEMENT IN THE PATAPSCO

Department of Natural Resources

The Maryland Department of Natural Resources manages natural resources lands under a number of designations, including State Parks, Natural Environment Areas (NEA), and Wildlife Management Areas, all of which are found in the Patapsco valley. State Parks are generally large areas developed for a variety of recreational uses, both day-use and overnight. Natural Environment Areas are large areas with significant or unique natural resource value in which development is limited to trails and interpretive facilities. Wildlife Management Areas are acquired and managed for the protection of wildlife, rather than for human purposes. As a kind of overlay for these management classes, some DNR lands may be identified as areas in their natural state, virtually undisturbed by human interference. These lands, often ecologically vulnerable are preserved for their research and educational value. Human activity is greatly restricted. Foot paths are usually allowed in such areas, but little else is permitted. Designation of an area as a wildland requires an act of the Maryland General Assembly.

Patapsco Valley State Park presently contains over 13,000 acres. Starting from a donation of 434 acres in 1912, the park was developed with the assistance of the civilian Conservation Corps in the 1930's, building camp sites, roads, and trails, and grew with the acquisition of about 8,000 acres in the 1950's. Additional acquisitions, the development of a master

plan for the park in 1972, and revisions necessitated by the damage caused by Hurricane Agnes in 1972 have all led to the current master plan for the park.

The Patapsco Valley State Park Master Plan was completed by DNR in 1979. The plan, which was authorized by the Maryland General Assembly in 1980, called for a green corridor contiguous to the river from Sykesville to Baltimore and, as proposed, increased the acreage of the park from the existing 11,347 acres to 15,200 acres. It suggested a mixture of intensive and passive recreational development throughout the valley, including a multi-use trail the entire length of the park, other trail systems, picnicking, camping of several types, playing fields and some specialized recreational facilities such as a golf course and swimming pools. Planned acquisition of land for the park is about 85% complete. Existing State legislation allows for continued DNR acquisition of land within one mile of the Patapsco and its major tributaries. Under this authorization, about \$1 million is presently budgeted in the upcoming fiscal year.

Currently there are about 27 miles of developed and marked trails in the Patapsco Valley State Park. DNR has most recently completed the Grist Mill Trail, a multi-use trail from Lost Lake to Swinging Bridge. It was built to accommodate hikers, bicyclists and equestrians. The one and one-half mile trail follows the river and provides scenic overlooks at several points. The trail is part gravel and part paved. It is accessible to the mobility impaired and visually impaired and is equipped with ramps, handrails, and fishing platforms for

handicapped at Lost Lake. The bridge at the Avalon Dam and Swinging Bridge connect the trail to a road through the Orange Grove area, for a continuous loop on both sides of the river.

Part of the park is also being leased for the construction of an equestrian center for the handicapped. The facility will include an indoor arena and an outdoor riding ring. The outdoor ring and accompanying seating area will be built with donated labor and railroad ties salvaged from the light rail project.

One development indicative of the collaborative opportunities possible for greenways implementation occurred in the summer of 1991, when the Maryland National Guard, as part of its summer training activity, constructed a small bridge and a section of trail in the lower reaches of Patapsco Valley State Park.

An analysis of Patapsco Valley State Park property for possible establishment of wildlands on some portion or portions of the park was carried out by a wildlands review team in 1991. This team was made up of individuals from DNR's Greenways and Resource Planning, State Forest and Park Service, Wildlife Division and Forestry Division, Tidewater Administration the Maryland Geological Survey, and from three private sector organizations: the Maryland Conservation Council, Maryland Wildlands Committee, and the Maryland Forests Association. In the draft report of the study, completed in 1992, Public Lands Administration did not recommend any sites for designation, due to the amount of existing and proposed development in the park, and because of

the extent of transportation facility impacts on the park.

The Morgan Run Natural Environment Area, consisting of about 1,300 acres located on a tributary to Liberty Reservoir, was established in 1975. A draft master plan for the area was released in 1992. The draft plan calls for redesignating Morgan Run as a Natural Resources Management Area to allow for more uses. including environmental education, fishing, hunting, hiking and equestrian uses. In Natural Resource Management Areas multiple-use management practices are employed for the maximum use of the natural resources of the area. The master plan links the various components of the park by a collector trail along the Morgan Run stream and feeder trails to special features. This trail network will connect to trails at Liberty Reservoir and Patapsco Valley State Park. Recommended acquisitions of additional land in the Morgan Run area include Greenway Gardens, a 27-acre parcel containing an arboretum, trails and overlooks, as well as buildings useful for classroom, office and maintenance facilities. This property, linked to properties proposed for protection under easements, would connect presently separate parcels of the Morgan Run NEA and provide a significantly lengthened greenway along Morgan Run. If DNR is successful in acquiring this land, the Carroll County Department of Recreation and Parks has agreed to operate and maintain the facilities there.

Hugg-Thomas Wildlife Management Area (WMA)is a 276-acre parcel in Howard County on the south shore of the Patapsco River, west of Maryland Rte. 32,

opposite the Town of Sykesville. Received as a gift in 1936, the area is managed to maximize the capability of the habitat to sustain desired populations of gray squirrels, to Cottontail rabbits, dove, quail and American woodcock and deer. Management practices integrate open rolling farmland with woodland. Twenty acres are kept as upland habitat fields and hedgerows, the rest is being preserved as woodland. The property has been open to public hunting as long as it has been held by the Wildlife Administration. A managed hunt program was established when extremely heavy use became a problem. Hugg-Thomas is a popular haven for birdwatchers, photographers and hikers.

Soldiers Delight is a DNR property managed as a Natural Environment Area. It is a unique area of nearly 2,000 acres to the east and adjacent to Liberty Reservoir featuring serpentine outcrops and rare plants. Minimal development is anticipated for the property, limited at present to a visitor center and hiking trails. However, the DNR Park Service and Greenways and Resource Planning are currently exploring its role in the Patapsco greenway network.

Department of Transportation

Several of the agencies of the Maryland Department of Transportation (MDOT) have a significant role to play in the Patapsco Greenway.

The Maryland Aviation Administration (MAA) is the owner of one of the single largest parcels of property in the Patapsco watershed, the Baltimore Washington International Airport (BWI). At the behest of the local legislative delegation, and

partly in response to stimulus from the Maryland Greenways Commission, the MAA has completed a feasibility study of a potential 10.5-mile hiker-biker trail around the airport which would ultimately connect Anne Arundel County's B & A Trail to Patapsco State Park. The trail is now scheduled for construction in four stages, beginning in summer of 1992. It will tie in local parks and community centers and include an observation area for watching airplane take-offs and landings. It will also provide a connection to the Benson Hammond House, a historic structure which houses the Ann Arrundell County Historical Society, and to a major county playing field complex at North County High School.

The State Highway Administration (SHA) has been working as a member of the BWI Trail Project Committee and will be constructing the first phase of the trail, the Benson-Hammond spur, as part of the project to widen Aviation Boulevard (MD Route 162). Part of the trail is routed through SHA property. The project is representative of SHA's support of MDOT's commitment to the environment and continuing interest in greenways as transportation elements.

The SHA is exploring the possibility of implementing a wetland mitigation project on state park property in the lower Patapsco. Under the proposed project, upwards of 20 acres of quality wetland would be established in a highly disturbed area, with the possibility of an interpretive trail loop and trail connection to other areas in the state park.

The <u>Mass Transit Administration</u>, another MDOT agency, is currently

studying how to incorporate a hiker-biker trail along the Central Light Rail Line being extended from downtown Baltimore to Glen Burnie and BWI. By connecting to the B&A Trail, it would also provide a more direct non-vehicular connection between Baltimore and Annapolis than the BWI Trail. A portion of this trail linkage is extremely important to DNR's plans for a multi-use trail from the Harbor to the Patapsco Valley State Park and along the entire length of the park.

All of MDOT's constituent agencies are currently evaluating the properties they own in the Patapsco watershed, as well as elsewhere in the State, to determine if any portions of them should be turned over to DNR or another greenway management agency. Another alternative might be that they continue to be held by MDOT, but designated as part of the greenway system and managed accordingly, at least on an interim basis.

LOCAL GOVERNMENT GREENWAY PROGRAMS AND PROJECTS

Imagine starting the day in Historic Annapolis, taking a bike ride along the B&A trail to Oriole Park for a ball game, perhaps going to a restaurant at the Inner Harbor and returning home through scenic parks. Such a trip, while once near impossible, could soon be reality, with the plans already underway by the local jurisdictions, making these and many other connections possible through greenway planning.

The following section describes the achievements and goals of the localities within the region. Many successful projects have been implemented in each of

the areas, and more are being planned. It is significant to note that many projects have been cooperative projects between local jurisdictions, and between the public and private sectors.

Town of Mount Airy

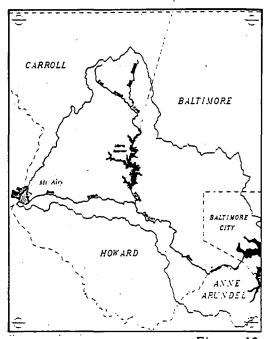


Figure 12

Mount Airy is located at the headwaters of the South Branch of the Patapsco River, just north of Parr's Spring, where the South Branch originates (See Figure 11). It is a small town, surrounded by beautiful natural areas and an abundance of wildlife.

The Planning Department of the Town of Mt. Airy is updating the town's comprehensive master plan, incorporating plans for an open space network and a trail system through the town. Some of the goals in the updated master plan are the identification and beautification of the main street corridor, and connection of the main street and other public open spaces

with surrounding neighborhoods. The town recently annexed a 500-acre parcel east of town and is looking to include it in the open space network. Working jointly with Carroll County, planners are creating a system of connected open spaces.

The town is currently studying the creation of a trail system along an abandoned railroad right-of-way from the town through an outlying park system to the Patapsco River. Staff from DNR have been providing technical assistance in engineering and landscape architecture, as well as researching opportunities to connect with the Patapsco Valley State Park. The approach Mt. Airy is taking in the trail acquisition is to ask adjacent land owners for easements along the railroad right of way. Residents in the area have been very cooperative so far. Town staff are also examining the possibilities of future rails to trails conversions along an existing active rail line.

Planners are studying stormwater management and runoff from Parrs Ridge and would like to undertake studies for the preservation of wildlife and protection of wetlands. All of these efforts in tandem can contribute to a network of open space which could be a part to the Patapsco Greenway.

Carroll County

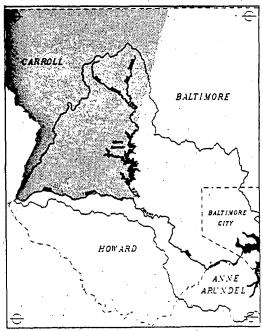


Figure 13

In addition to assisting the Town of Mt. Airy with its Open Space and Town Center Plans through development review services, Carroll County is in the process of preparing a greenway plan as a part of its Parks and Land Preservation Plan. The Department of Planning has selected a consultant who will study existing and planned greenway networks of Carroll County and other jurisdictions, natural resources and environmental constraints; as well as legal considerations. They will then make recommendations as to the location and nature of potential greenways, coordination with surrounding systems, and some of the mechanisms for implementation of the greenway. This will include discussion as to the feasibility of an overlay protection zone and public easement program.

Possible areas for greenway initiatives are along the South Branch Patapsco from Sykesville to Mount Airy and Parrs Spring; Morgan Run, northwest of Liberty Reservoir, as it emerges from Morgan Run Natural Environment Area; and Joe's Run up to Westminster. Another potential greenway could connect the Patapsco Valley State Park to county-owned Piney Run Park. These areas lie mostly in districts already designated for conservation in the Carroll County Master Plan.

The County, in cooperation with the Town of Sykesville, has created a pedestrian trail on an abandoned rail line from Piney Run Park through Sykesville to the Patapsco River. The Town of Sykesville has been actively revitalizing its town center, restoring historic structures, creating riverfront parks, promenades and overlooks, plazas and fountains. Much of the redevelopment revolves around the railroad station and rail trail.

Carroll County is also targeting Piney Creek and Alloway Creek for restoration. The intention is to draw on state and public involvement to help analyze the problems, develop solutions and to take action to clean up the watersheds. The restoration of these stream valleys will advance water quality as well as realize the importance of the protection of the lands along the streams. The corridors of open space created also enhance and expand the greenway network throughout the county.

Howard County

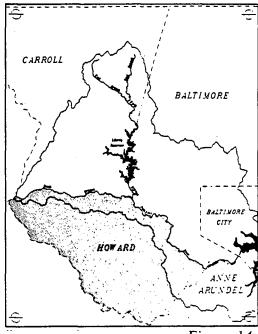


Figure 14

Howard County is in the process of compiling a Comprehensive Park, Open Space and Recreation Plan which is expected to be completed by June of 1993. Several stream and river valleys are considered prime candidates for greenway recognition: the Patuxent River, the Patapsco River, the South Branch of the Patapsco River, the Middle Patuxent River, the Little Patuxent River, Cattail Creek, and Cabin Branch. In addition, lesser tributaries are included as well, such as Hammond Branch and Deep Run.

The proposed plan would expand the Patapsco greenway by acquiring land along the South Branch of the Patapsco. Immediately across the Patapsco River from Sykesville, Howard County is using state floodplain management grant funds to acquire two properties within the floodplain. These properties would also connect Hugg-Thomas Wildlife

Management Area to Patapsco Valley State Park. At this site the County plans the creation of a small neighborhood riverfront park with a playground, picnic tables and trails.

Howard County's open space plan also proposes connecting the Patapsco Greenway to the Patuxent Greenway by way of Long Corner. Both the Middle Patuxent and the Little Patuxent Greenways would serve to connect the existing parks and environmental areas' along their banks to each other, as well as connect the Patapsco system to the extensive greenway systems of Columbia and the Patuxent River. The Middle Patuxent River Valley is seen as a portion of the "Mid-County Greenbelt" as designated in the 1990 General Plan. It serves as a buffer between the densely developed eastern sector and the more rural western portion. The greenbelt includes several county parks, the University of Maryland Central Farm, and an area the county plans to purchase for the Middle Patuxent Environmental Area. The Little Patuxent connects with the Columbia open space network and runs through Savage to Alpha Ridge Park. In progress is a trail along the Little Patuxent from Lake Elkhorn to Savage Park. The trail will be created using abandoned roads, railroads and sewer line rights-of-way.

The County has been active in the restoration efforts at Ellicott City, an historic town bordering Patapsco Valley State Park, and the protection of the Ellicott City B&O terminal, dating back to 1831. This terminal was America's first railroad terminus. The County also provided streetscape improvements and a small park at Ellicott City. Although the

CSX Rail Line along the Patapsco is still an active line, the County sees potential for its future use as a rail trail, should it ever be abandoned. The line runs the length of the Patapsco, for over 30 miles, crossing back and forth between Howard and Carroll counties. A portion of the line in Carroll County, near Mount Airy, has been abandoned and is being studied for conversion to a rail trail.

Through public education, Howard County is involving citizens in the care of the environment. Courses and workshops on wetlands, wildlife, and tree planting foster an understanding and appreciation of natural systems and the impact of human actions. County sponsors hope that increased knowledge and awareness will also assist enforcement of ordinances, as people come to understand their importance.

Baltimore County

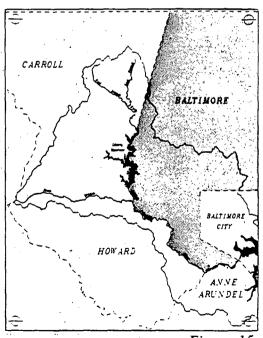


Figure 15

Baltimore County has an extensive network of rivers and streams. The county sees an excellent opportunity for a series of greenways in stream valleys and over ridgetops, connecting several state parks, county parks, reservoirs, and the greenways of Baltimore City. The county has been active in developing a plan and coordinating with other local governments in the region to promote and implement these greenways.

The Patapsco Park and Open Space Concept Plan, developed by Baltimore County's Office of Planning and Zoning, proposes greenways along Ben's Run and Dogwood Run, and connects them to Patapsco Valley State Park at Hollofield, as well as to each other. This plan ties county-owned Western Area Park into the greenway network. The plan recommends the incorporation (and possible privatization) of equestrian trails and stable operation. The plan also provides for a sports complex, camping, golf course expansion, and the acquisition of parcels with archaeological and educational potential.

As part of major planned development, the Owings Mills area is slated for connection with the Patapsco greenway system. Linked to Woodlawn via the Scotts Level Branch and Gwynns Falls greenways, the three greenways form a loop with the Baltimore City greenways. Much of this greenway has already been dedicated as open space through subdivision regulation. Ultimately, with the extension of greenways along Red Run, this loop could connect Soldiers Delight Natural Environment Area and Liberty Reservoir to local parks along Gwynns Falls and Norris Run. Another greenway

along Falls Run would also connect Soldiers Delight and Liberty Reservoir with Patapsco Valley State Park.

Protection of Scotts Level Branch, Red Run and Gwynn's Falls has been studied and parcels identified for greenway connections and extensions. The County has developed a plan for the methods of acquisition in these corridors, which include fee simple purchase, easements, leases, gifts, and dedication through the subdivision process. The Stream Valley Park System will involve the conversion of unused school sites to parks in the Randallstown and Horsehead Branch areas to parks. These parks would include play and picnic areas, trails, and wildlife areas.

Other important greenway connections being considered are along Soapstone Branch and Cooper Branch. These greenways would link together Patapsco Valley State Park, University of Maryland Baltimore County Campus (UMBC), the rail trail along the #9 Trolley Line, and a proposed rail trail from Catonsville into Baltimore along the #8 Trolley, and the Caton-Loudoun Railroad.

Baltimore County also envisions a series of greenways tying together the Patapsco watershed with that of the Gunpowder Falls, including connections to Prettyboy and Loch Raven reservoirs and ultimately to the Maryland DNR's Northern Central Rail Trail. These proposed interconnections of the Patapsco Greenway system with the Gunpowder system are shown by dashed lines on Figure 11.

Not all of these greenways would serve the same purpose or support the same level of activity. Some may have ballfields and active recreation facilities, while others may be strictly scenic or hiking corridors. Baltimore County has classified trail types and made recommendations as to where each type of trail would be most appropriate. High intensity trails of hard surfaces would be constructed for use by bicyclers, joggers, and mothers with small children and strollers. Medium intensity trails, of crushed stone or stone dust would support hiking, biking, jogging, and horseback riding. Low intensity trails, narrow paths cleared of vegetation, but otherwise virtually undisturbed, would be for hiking only.

Baltimore County has been working with state, federal and local governments, local residents and elected officials to restore the historic mill town of Oella. Renewal efforts include water and sewer and street improvements, building rehabilitation, parking for park and shoreline access, and improvements to the bridge connecting Oella with historic Ellicott City on the opposite bank of the Patapsco. Funding for planning studies was provided by Community Development Block Grants. Some of the participants in this cooperative effort were Baltimore County Offices of Planning and Zoning, Recreation and Parks, Traffic Engineering, the State Highway Administration, Ellicott City Restoration Foundation, Baltimore Gas and Electric Company, and Friends of the Patapsco Valley Inc.

Anne Arundel County

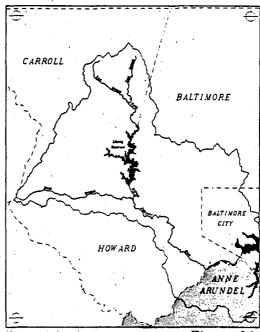


Figure 16

The Lower Patapsco River is the dividing line between Anne Arundel County and Baltimore County. The river is flanked on both shores by portions of Patapsco Valley State Park. This section of the river is characterized by ponds and small lakes left as a result of surface mining operations, and a network of small streams. Most of Anne Arundel County's Patapsco shoreline is included in the state park. There has been very little facility development in this narrow portion of the park, and much of the state land has been degraded. Rehabilitation of this section has been the subject of some exploratory discussion between DNR and Anne Arundel County staff. There is the potential here to establish a ribbon of green through a fairly developed urban area, connecting the various parcels of Patapsco Valley State Park with Baltimore County's Southwest Area Park and Cherry Hill Park in the City of Baltimore.

Anne Arundel County, together with the DNR Tidewater Administration Watershed Growth and Management Division, prepared a series of Watershed Management Plans as a part of a Comprehensive Watershed Management Program. One such plan is the Sawmill Creek Watershed Management Plan. Sawmill Creek is a tributary of the Patapsco, southeast of BWI Airport. While previous watershed studies concentrated on stormwater management issues and made recommendations about flooding, erosion, sedimentation and water pollution, the Sawmill Creek study also addresses land management, land use planning, park and open space planning, and environmental resource conservation. The study recommends environmental protection measures; zoning wetlands and floodplain as open space districts, thereby protecting the sensitive area and at the same time reducing owner tax liability; and the development of a linear park system along Sawmill Creek from Severn Danza Park to Pleasantville Park. More than 75% of the mainstem of Sawmill Creek is currently within county open space zoning that coincides with the creek's floodplain protection easements.

The BWI Trail, being developed by the Maryland Aviation Administration, will eventually be a significant connector between the Patapsco Valley State Park, Sawmill Creek Park and Anne Arundel County's B&A Trail. The B&A Trail is a 13.3 mile macadam bicycle trail from Dorsey Road in Glen Burnie to Route 50 just across the Severn River from Annapolis. If the entire BWI Trail plan is implemented, hikers and bicyclists will be able to walk or ride from Baltimore's Middle Branch Park through a variety of

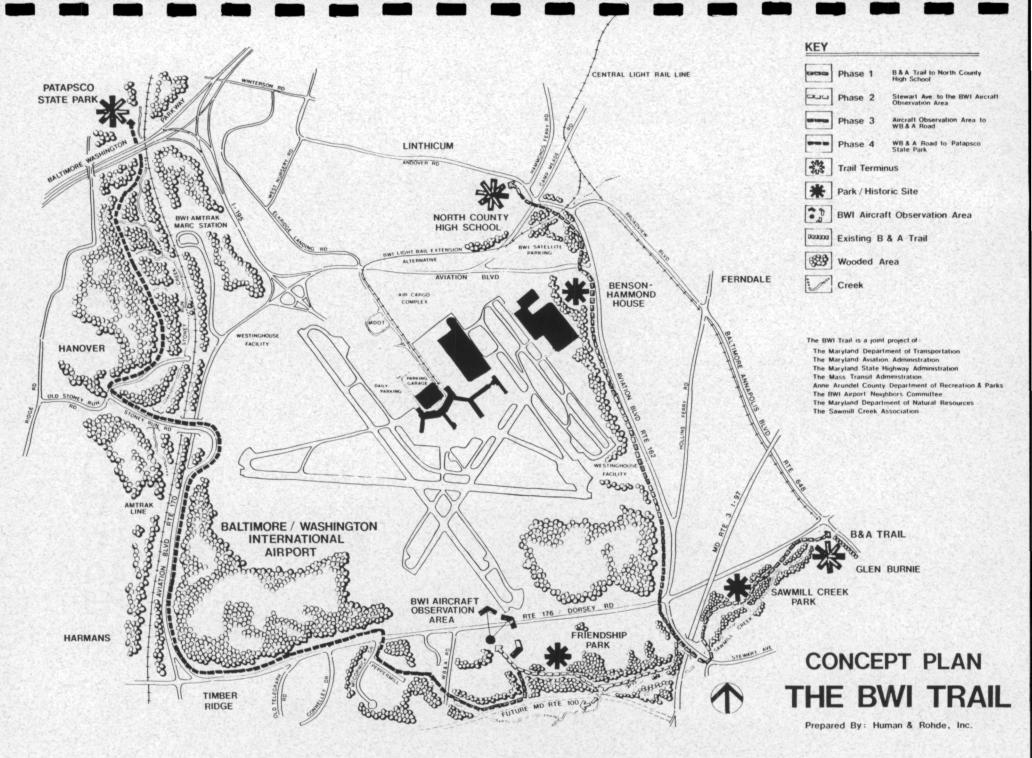
natural and cultural landscapes to the Annapolis Historic District, mostly on a trail separated from vehicular traffic. The trail will tie in Anne Arundel County's Friendship Park, Pascal Senior Center and Brownshade Community Recreation Area.

The BWI Trail is a cooperative effort of the Maryland Department of Transportation, the Maryland Aviation Administration, the Anne Arundel County Department of Recreation and Parks, the BWI Neighbors Committee, the Maryland Department of Natural Resources, the Mass Transit Administration, the Sawmill Creek Association, and the Ann Arrundell County Historical Society. Anne Arundel County Department of Recreation and Parks maintains the trail.

In the future, another connection is planned for the south end of the B&A Trail, so that the County's South Shore and West County Trails can link through Annapolis and its proposed Parks and Paths for People to the B&A Trail.

Also under construction is the extension of the Central Light Rail Line out of the City of Baltimore. Extensions will tie the light rail into the BWI Airport and the planned hiker-biker trail. The Department of Transportation is considering the feasibility of including a hiker-biker trail along side the Central Light Rail Line. This trail would enhance accessibility to parks and city attractions and tie into the other local and regional greenways.

Anne Arundel County has many local parks outside the Patapsco Region and is also working on connecting these through additional trail systems, floodplain



greenways, and subdivision open space dedication. The goal is to link a number of systems to the B&A Trail and thus to Annapolis, Patapsco Valley State Park and Baltimore's Inner Harbor.

City of Baltimore

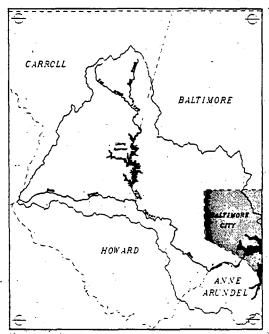


Figure 18

The City of Baltimore has been actively reclaiming green space and waterways and expanding greenways as envisioned by the Olmsted plan of 1904. The City currently has only 10% of its land in open space, and the dense pattern of development and lack of available land makes greenway expansion a difficult and expensive undertaking. Nevertheless, the City is working to expand its open space network and connect greenways throughout the city, including opportunities along the three major stream valleys - the Jones Falls, the Gwynns Falls and Herring Run. This system of greenways would connect such important attractions as the Inner Harbor, Middle Branch Park, Gwynns

Falls/Leakin Park, Druid Hill Park, the Baltimore Zoo, and the Cylburn Arboretum. Working with the surrounding jurisdictions and the state, Baltimore will tie its greenways into Patapsco Valley State Park, Sawmill Creek, the B&A Trail and BWI Airport. Eventually, as Baltimore County implements its greenway plan, Baltimore City's greenways could be linked to Soldiers Delight Natural Environmental Area, Liberty and Loch Raven Reservoirs, the Northern Central Rail Trail and Gunpowder Falls State Park.

One of the city's most significant greenway projects has been the creation of Middle Branch Park. Actually a series of interconnected parks, Middle Branch Park will surround much of the Middle Branch of the Patapsco. The plan has involved the cleanup of industrial sites and dumping, reclamation of wetlands, diversion of roads, street improvements, industrial redevelopment, shoreline stabilization, boat ramps, sewer improvements, park development and landscaping. A trail system will connect the public areas of the park, as well as connect to the Baltimore Inner Harbor, Patapsco Valley State Park, and Gwynns Falls/Leakin Park. The project also includes educational programs at all levels and the creation of a Water Resources Center to teach water safety and urban waterbody ecology. The project is a creative endeavor, coordinating funding and expertise of the city, the state, private industry, non-profit organizations and citizen groups. Technical assistance and improvement funds have come from many programs, including Urban Renewal, Program Open Space, Coastal Zone Management, State Waterway Improvement, U.S. Bureau of Outdoor

Recreation, U.S. Department of Health Education and Welfare, the City Departments of Parks and Recreation and Education, the Nature Conservancy, and the Maryland Ornithological Society. The park provides biking trails, fishing and crabbing piers, ballfields, picnic areas, scenic overlooks, and boat facilities. The park is a major accomplishment for environmental, recreational and economic development within the City of Baltimore.

The City is presently concentrating its efforts on acquiring land or easements along the water's edge of the Gwynns Falls and Middle Branch of the Patapsco River. It is also exploring the possibility of acquiring land or easements which would link the Middle Branch Park with Patapsco Valley State Park. Acquisition of additional parkland along the Middle Branch itself will complete and enhance this greenway connection. The Gwynns Falls/Middle Branch Plan identifies priorities to enhance and expand the wetland base, address nonpoint source pollution, protect the floodplain through inclusion of open space, and increase natural habitat. It will also focus onredevelopment of deteriorated urban waterfronts and the incorporation of public access to the waterfront through linear walkways and nodal parks. The next step in the Gwynns Falls/Middle Branch Plan is to develop an implementation strategy so that, as funds become available, the plan can quickly become reality. The City Planning Department is currently pursuing grants to fund preparation of the implementation strategy.

The B&O Railroad museum has recently received a donation from CSX Railroad of much of the CSX right-of-way

between the museum and Gwynn's Falls. The City is working with the museum on a greenway connecting the downtown to Gwynns Falls/Middle Branch Greenway.

Another major urban greenway project is the creation of the Baltimore Waterfront Promenade. This project, coordinated by the City with the Baltimore Harbor Endowment, is a project to restore life to the Harbor and encourage community access, appreciation, and pride for the historical harbor which has been a shaping force for Baltimoreans. The Waterfront Promenade is a 7.5 mile continuous walkway rimming the shoreline from Canton to Key Highway. It is to be a nature and history trail through gardens and Baltimore's famous neighborhoods. The project involves environmental restoration through shoreline and marsh plantings, educational signage, and aeration at the Jones Falls outfall. Citizens are involved in buying bricks for the promenade, in tree and grass planting, shoreline cleanup, and educational programs. The promenade is half complete, and enthusiasm for the project continues to build.

In addition to activities within the City, the Baltimore Department of Public Works manages the buffers surrounding Liberty, Loch Raven, and Pretty Boy reservoirs. Here, opportunities for boating, fishing, horseback riding and hiking have been made available. Bow hunting is allowed at Liberty and Loch Raven to control the deer population.

All of these efforts serve to increase open space within an urban environment and link this area with outlying open space networks.

IMPLEMENTING GREENWAYS IN THE PATAPSCO RIVER VALLEY PUBLIC AND PRIVATE SECTOR ASSISTANCE

Greenway creation is the weaving together of often disjointed parcels of land into a tapestry of continuous open space. Therefore, it requires the use of many programs and the activities of a variety of participants, public and private, choosing the techniques that best address the specific circumstances--physical, economic and social/political--of each particular greenway and greenway segment or project. Leadership of the greenway creation effort will also vary. In the case of the Patapsco, in part because of its size and in part because of its designation by the Maryland Greenways Commission as a priority greenway, overall planning leadership is being provided by the Department of Natural Resources, in collaboration with the associated local governments and with the assistance of an advisory committee and public input. Subsequent project planning and implementation will be assumed by other participants as the process moves into their area of interest. DNR's interest in those implementation phases will focus primarily on the corridors of the Patapsco and its major tributaries, where the Department's land ownership responsibilities are concentrated. Detailed planning for smaller tributaries and headwater areas will fall more to local governments, working with private land owners and community groups.

This chapter identifies some of the players who may be involved in further planning and development of the Patapsco Greenway, and it describes the tools and programs available to implement various aspects of the greenway.



STATE AGENCIES

Many agencies in the Maryland Department of Natural Resources and in other state 'departments, play a part in establishing the Patapsco Greenway. Areas of involvement for the different segments of state government include planning, regulation, funding, and technical assistance. Some agencies are also major land holders and managers.

DNR's Public Lands Agency has stewardship of more than 240,000 acres of land in the State. It is responsible for the integration of DNR planning, acquisition, construction and maintenance, publicprivate partnership development, and environmental easement donations. The Greenways and Resource Planning Program is coordinating the establishment of the Patapsco Greenway. It works with other state agencies, the counties, and municipalities as a clearing house for information on existing resources such as vegetation, soils, slopes, hydrology, existing built environments, water bodies, rare and endangered species, historical and archeological sites, etc., and on the mechanisms by which these resources are, and can be, protected and managed. The information is currently being collected in a computerized Geographic Information System, which allows mapped and other data to be compiled from many disparate sources and combined, manipulated and updated more easily and rapidly than is possible with manual methods. The hope is that this system will facilitate local planning and the coordination necessary for development of a regional greenway network.

Part of the overall charge to the Greenways and Resource Planning Program is to develop or revise state park master plans. Although no staff or funding is presently available for such an effort, revision of the 10-year old Patapsco

State Park Master Plan may be called for, including an analysis of where new facilities are needed, evaluating what kinds of facilities are needed to accommodate new recreational trends, and creating a trail system that will accommodate hikers, bicyclists and equestrian users, and connect with locally developed trails. These items would then be submitted as a part of the region's capital budget request for park development and would be part of DNR's phase three implementation responsibilities.

A final responsibility of the Greenways and Resource Planning Program relevant to the Patapsco Greenway is as the planning leader under the state Rails-to-Trails program. As noted above, several rail trail projects have been or are being developed in the Patapsco area. Should additional opportunities for conversion of rail corridors to trails arise, these would be coordinated with the Department of Transportation.

DNR's Program Open Space (POS) is the state's funding mechanism for purchasing land from willing sellers for forests, parks, wildlife management areas, environmentally sensitive areas, Bay access, and natural heritage areas. POS also helps fund easement programs through the Maryland Environmental Trust and the Maryland Agricultural Lands Preservation Program. It accrues revenue by receiving 0.5% of Maryland's real estate transfer tax. This money is divided between State land

acquisition (and some recreational development) and reimbursement of local expenditures for open space acquisition and development. POS has an active State acquisition program for lands within a mile of the Patapsco River mainstem as well as its four major branches. As future land acquisition priorities for the greenway are established, these funds will continue to be used.

The Public Lands Agency also administers DNR's involvement with the Maryland Environmental Trust, described below.

DNR's Tidewater Administration. Coastal and Watershed Resources Division coordinates Maryland's Coastal Zone Management Program. The division uses funds from the Office of Ocean and Coastal Resource Management and the National Oceanic and Atmospheric Administration (NOAA) to provide financial assistance to local governments and state agencies for coastal management, and for improving the data base for better decision making. It ensures that state and local projects take into consideration preservation and protection of coastal resources. As a result of a Coastal Zone Management Grant the beginning section (2 miles) of the Patapsco Hiker/Biker Trail has been completed. The Patapsco Greenway Study is also being funded in part through a Coastal Zone Management Grant.

The division also incorporates environmental review with planning and development and growth management. It reviews plans at the state and county level that have impact on water resources--tidal and non-tidal, and makes recommendations regarding land use and environmental quality, including recommendations regarding parks and open space, and greenway linkages. It works in a planning and advisory capacity with the local governments in the preparation of watershed management plans, such as the Sawmill Creek Watershed Management Plan.

Any permits required for projects are handled through the Power Plant and Environmental Review Division. This division evaluates the impact of development on a case by case basis, as well as cumulative impacts watershedwide. Also under the Tidewater Administration are the Chesapeake Bay Research and Monitoring Division, which monitors water quality of the Bay, and impacts on habitat and indigenous species, and the Tidal Fisheries Division, overseeing tidal fisheries.

DNR's Water Resources
Administration (WRA) is responsible for
the protection, management and
development of Maryland's water
resources. Several divisions of WRA have
functions or programs relevant to
implementing a Patapsco River Greenway.

The <u>Dam Safety Division</u> is responsible for ensuring the safety of the state's 315 inventoried dams, of which there are 14 on the Patapsco River and its tributaries, as well as for permitting new dams. Division efforts on the Patapsco River have been directed toward eliminating fish blockages in the existing dams. Fish ladders are being installed at Bloede and Daniels dams and negotiated for the Simkins Industry dam.

The Minerals, Oil and Gas Division regulates the operation of non-coal surface mines to facilitate the removal of valuable sand, gravel and stone deposits while protecting public safety and the environment and ensuring reclamation of the sites. Funds received from licenses. permit fees, bond forfeitures and other sources are held in the Surface Mine Land Reclamation Fund to be used for program administration and for reclamation of abandoned "pre-law" mines. License and permit fees generate on the order of \$100,000-\$120,000 per year to the fund. There are several areas where pre-law mines existed in the lower section of the Patapsco River. Reclamation Fund monies could potentially be used to reclaim the areas for public access or for wildlife enhancement.

The Floodplain Management Division provides a grant program to support technical flood studies and to aid local jurisdictions in the implementation of projects for mitigating flood hazards. Technical floodplain studies have been undertaken for 29 watersheds including the Patapsco. The main emphasis of the grant program has been on the acquisition of developed flood-prone properties, removal of the structures and return of the properties to their natural functions. Anne Arundel and Baltimore Counties and Baltimore City have all made considerable use of this program to purchase and clear properties in the Patapsco system. Use of this program can help undo past development mistakes and help to create stream valley greenways by returning land to open space.

The Nontidal Wetlands Division is responsible for the implementation of the

1989 Nontidal Wetlands Protection Act. As a part of this act the division administers a nontidal wetlands compensation fund. These monies are to be used for purchasing land and restoring and creating nontidal wetlands. There are many areas along the Patapsco River that could benefit from wetland restoration or creation. The grant could also be used as a funding source for the acquisition of important greenway linkages which contain wetland areas.

DNR's **Boating Administration**, Waterway Improvement Program through its <u>Waterway Grants and Project Planning Division</u> is responsible for planning and development of projects and activities which benefit the general boating public throughout the State. This program is an important funding source for the development of recreational boating facilities on the Patapsco River.

DNR's **Resource Conservation Service,** Forestry Division provides many forms of assistance through its foresters, biologists and support staff. Forestry programs available include: Green Shores. a program to establish forested buffers along Maryland's waterways; Tree-Mendous Maryland, a program set up to involve Maryland's citizens in the reforestation of the state; Urban and Community Forestry Assistance; Woodland Incentives Program; and the Forest Conservation and Management Program. Features of these programs range from forest management planning, through technical assistance and provision of stock, to tax incentives for maintaining lands in forest cover. Both public and private landowners may be beneficiaries of the various forestry programs. All of these

programs have the potential to help in the creation and maintenance of forested open space along the Patapsco.

The State's new Forest Conservation Act requires the retention of forested areas on development sites, particularly in sensitive areas such as stream buffers, steep slopes and highly erodible areas. It also requires the afforestation of up to 15% of development sites which are presently unforested. This program offers an opportunity to help extend greenways into neighborhoods where people work and live, linking them to larger regional greenways.

The Natural Heritage Program is the protection agency for the State's rare, threatened and endangered species. Technical and scientific staff in the program evaluate potential impacts of land use changes on rare species, conduct research and education programs, and advise in management and acquisition decisions. In the Patapsco watershed there are several areas of importance from a natural heritage perspective, including over 10 non-tidal wetlands of Special State Concern, several rare species sites, and Soldiers Delight Natural Environment Area, where a rare natural community occurs on serpentine rock outcrops. This community provides habitat for a number of rare plants. These areas require special care in greenway planning to insure that their special values are protected. As the Natural Heritage Program helps identify sensitive areas for protection, these areas can be special natural links in the greenway corridor.

The <u>Freshwater Fisheries Division</u> manages, through regulation and stocking, Maryland's freshwater fishery resources.

Class III streams, cold water trout streams, are managed for populations of invertebrates which may not exist in other local streams. The Fisheries Division stocks class IV streams in the spring, allowing a generous harvest before summer temperature stress causes mortalities.

The <u>Wildlife Division</u> administers recreational hunting on State lands, such as some areas within Patapsco Valley State Park, setting seasons and bag limits for game species. The division also provides educational services and technical expertise to private landowners.

The Maryland Environmental Trust was created by the General Assembly in 1967 to conserve, improve and perpetuate the state's natural environment. It is funded by the state, through the Department of Natural Resources and the Department of Transportation, as well as through gifts of personal and real property. MET is governed by a 15-member board of trustees, including the Governor, President of the Senate, and Speaker of the House, and 12 volunteer citizens from across the state. It is an autonomous agency charged with the administration of conservation programs.

MET's most active program involves arranging the donations of conservation easements to ensure the protection of open areas such as agricultural land, forests, wildlife habitat, historic sites and properties with scenic features. Currently there are 28 MET easements within the Patapsco watershed and much more of the Patapsco Greenway may be protected by easement in the future. MET also supports the establishment and operation of local land trusts which may be able to provide

protection for parcels of local greenway interest.

The Chesapeake Bay Critical Area **Program** applies to the Lower Patapsco in the tidal waters of the river. The program is intended to protect and enhance water quality of the Bay and its tributaries by controlling activities on the lands immediately adjacent to them. The Critical Area is that land extending 1,000 feet landward from mean high tide of tidal waters or 1,000 feet landward from tidal wetlands. Local Critical Area programs, approved (and periodically resubmitted and reapproved) by the Critical Area Commission must define three development zones within the Critical Area, to which different future development criteria, of varying restrictiveness, apply. Within the Critical Area, reduction of impervious surface, maintenance or re-establishment of forest cover, establishment or maintenance of wildlife corridors, and some recreational development are all encouraged and in some cases required. A 100-foot natural buffer is also required to be maintained adjacent to tidal waters and tidal wetlands.

Corridors established and regulated under the Critical Area program can clearly make important contributions to the greenway network in the tidal portion of the Patapsco Valley, in most cases with little need for further public acquisition of easements or fee simple ownership. Provisions of this program will also impact the recreational development which will be programmed for the state park in this portion of the greenway, setting some areas aside for little or no development.

The Chesapeake Bay Trust is a public non-profit organization created to promote a partnership between government, the business community, and the public in support of the restoration of the Chesapeake Bay. The Trust's board of trustees considers applications for financial support from community groups, private organizations, schools and public agencies for Bay restoration and awareness projects. In a project relevant to this study, volunteers from Baltimore County and Baltimore City were sponsored by the Trust to perform a water quality assessment project on Dead Run, a tributary of the Patapsco River. The funding of similar projects could further greenway development by providing information and creating public awareness.

The State Highway Administration in the Maryland Department of Transportation has the responsibility to assure that the needs of bicyclists are considered in conjunction with maintenance and highway improvement. Besides accommodating bicycle safety in highway design and shoulder width, SHA can design bridges either to impede or to accommodate fish and wildlife passage. SHA is currently working to provide hiker/biker access and trails in two sections of the Patapsco River Valley as part of its road improvement projects: the BWI hiker biker trail and the bridge over 640.

Under recently enacted Federal highway legislation, SHA's role in greenways is likely to be expanded. The Intermodal Surface Transportation Efficiency Act (ISTEA) sets aside several sources of funds which can or must be spent on development of trails or the acquisition or development of other

potential greenways elements, such as historic or archeological sites, as well as such related facilities as scenic roads and drives. ISTEA funding is now being used to build the first leg of the BWI Trail.

A final way in which SHA may contribute to greenway establishment is by supporting wetland creation or restoration in mitigation for highway project impacts on wetlands elsewhere, as is currently being studied for a site in the Lower Patapsco. In some cases mitigation projects may require the acquisition of additional lands for wetland creation, which could augment the protection of the corridor by the public sector.

The Mass Transit Administration's Freight Services Section (formerly part of the State Railroad Administration) is the State's contact with the Interstate Commerce Commission on proposed abandonments of active rail lines. It coordinates the State's response to such proposals, soliciting opinion from the Department of Natural Resources, local governments and Chambers of Commerce, and shippers on the lines proposed for abandonment, and cooperates with DNR and the Maryland Office of Planning in evaluating the potential of such lines for conversion to trail use. The Maryland Department of Transportation presently owns 204 miles of railroad right-of-way. Approximately 104 miles of this mileage is in service; the remainder is available for trail conversion under the auspices of federal and state Rails-to-Trails conversion statutes.

State Rails-to-Trails law envisions two major mechanisms to effect the conversion of abandoned railroad rights-of-way to trail use. The first is a program where the Department of Natural Resources would lease out-of-service, state-owned railroad rights-of-way and convert those properties to trail use. The second is a program where DNR, working in concert with MDOT, would seek to acquire rights-of-way identified for abandonment by railroads, where such abandonments are not opposed by state agencies or municipal governments. This is the mechanism likely to be used to convert future abandoned railroad rights-of-way in the Patapsco region to trail use.

The **Department of Agriculture** administers The Maryland Agricultural Land Preservation Foundation which was created by the General Assembly in an effort to preserve productive agricultural and forest land. This is a completely voluntary program that provides for the establishment of agricultural preservation districts and the sale of development-rights easements.

Agreement between a landowner and the Foundation to create a district commits the farm owner to refrain from any residential, commercial or industrial development of his property for five years. Once in such a district, the landowner may sell the development rights to his property to the Foundation. Local governments in the Patapsco supplement the State program in a variety of ways: Baltimore County provides property tax credits to farmers who place their property in agricultural districts; Carroll County supplements the Foundation payment for development rights with its own funds; and Howard County purchases easements outright, using creative financing mechanisms including installment purchases.

Agricultural preservation programs are intended to retain lands in agricultural production, not to create greenways. However, where lands protected for agriculture border streams or other greenway components, particularly where they are contiguous to other protected properties, they can contribute to corridors of undeveloped lands available for wildlife, aesthetic benefits and, if properly managed, water quality protection. Owners of such properties are voluntary participants and represent an important human resource for land conservation in the private sector.

The Maryland Office of Planning (MOP) is responsible for broad statewide planning including the preparation of the Maryland Land Preservation and Recreation Plan. A greenways element is being prepared for the plan which will begin to link the Patapsco greenway to other greenways in the state. MOP also produces guidelines for the development of local open space plans, which will include greenways elements, and oversees preparation of many local comprehensive plans.

Data important for planning greenways at either the local or state level are also collected and mapped by MOP in its geographic information system (GIS). Regional maps of land use and land cover can be particularly important for identifying greenway opportunities and constraints, as evidenced in this report.

The Maryland Greenways
Commission is a Governor-appointed body charged with identifying and establishing greenway linkages throughout the State.
The Commission has identified establishment of a Potomac River

Greenway and a Patapsco River Greenway as long-term goals. A number of smaller projects along stream valleys or other natural corridors are also being pursued in conjunction with local governments and citizen groups.

The Commission maintains an inventory of state and local greenway projects and promotes regional and interstate greenway connections. The staff works to identify federal and private resources for use in building the statewide network of greenways and coordinates a variety of state resources. The Commission is chaired by the Secretary of the Maryland Department of Transportation and has a director and small staff housed within Greenways and Resource Planning at DNR.

COUNTIES AND MUNICIPALITIES

The Greenways Commission's 1990 Report to the Governor recognized the crucial importance of local planning and action for implementing greenways. Some important local actions recommended in this report include the following:

- ♦ Appropriate county authorities should formulate and provide assistance to developers for compliance with reforestation and tree-cutting policies.
- Floodplains delineated during the zoning, site plan review, or land subdivision processes should be deeded to public or quasi-public organizations to enhance the greenways network.
- Counties should indicate hiker/biker paths, wildlife corridors, and safe separate crossings during site plan review and subdivision processes and the highway planning and construction process.
- ♦ All local zoning regulations should allow clustering and provide for transfer of development rights from designated greenways.
- ♦ Local jurisdictions should be encouraged to adopt a stream valley protection system such as those established by Baltimore, Montgomery, and Prince Georges Counties.
- ♦ Each local government should be encouraged to implement a greenways program that includes a local advisory board.

These recommendations acknowledge that in Maryland, land planning is done primarily at the local level. State and Federal laws addressing resource development and conservation (critical areas, wetlands, floodplains) are enforced locally by professionals with an intimate knowledge of the local resources. In addition, local protection tools, such as easements, treecutting ordinances and revegetation policies, subdivision review, special zoning ordinances, stream valley dedication, tax incentives and penalties, clustering of development, landscaping requirements, and construction standards are critically important complements to explicit greenway planning and public land acquisition.

Three significant tools that can be used by local governments to help create greenway networks are the master planning process, zoning ordinances and subdivision regulations.

Master Planning Process: Master plans that include a greenway framework can be developed by all the counties and municipalities to protect important linkage areas. To be eligible for funding from the State's Program Open Space, each local government in Maryland is required to prepare an Open Space and Land Preservation Plan. Under guidelines prepared by the Maryland Office of

Planning, revised plans required by 1993 will have to include greenways elements. Current planning of Patapsco Valley local governments with respect to public parks, open space and greenways is summarized under "Plans & Goals of Major Greenway Partners". The following pages focus on other ways in which local governments can add, and in some instances are already adding, to a greenway network.

Zoning: Certain types of zoning tools used by local jurisdictions present opportunities for the creation of greenway networks. These include planned unit development zones (PUD's), cluster zones, resource conservation zones, comprehensive design zones and other floating zones, such as the floodplain overlay. The opportunity for creating greenways grows out of the requirement that open space and recreation land be designated on a site or development plan that becomes part of the zoning approval process.

Subdivision Regulations: Most jurisdictions have powers within their subdivision regulations to protect sensitive environmental areas such as wetlands, floodplains, waterways, sensitive habitats and steep slopes. These regulations may also require the mandatory dedication of open space within new developments. Subdivision reviews held with developers ensure their accommodation of greenway elements.

Throughout the Patapsco study area, counties and municipalities have been using the above tools for the protection of ecologically sensitive areas and the conservation of green space. Coordination of these efforts will be more comprehensive with the development of jurisdictional greenway plans as part of the master plans, and correlation with the regional greenway plan. Significant strides have been made toward the creation of a regional greenway through current county projects and legislation.

The following section describes the specific tools being used by local governments in the Patapsco region to protect natural resources and to augment

open space systems. It should be noted that these tools have come into play over a considerable span of time, some of them only recently. Thus, much development which would today be restricted (e.g., on steep slopes or in floodplains) has occurred in the past in such areas, interrupting the natural greenways. Understanding of the different tools and their level of success will be important to formulating a successful strategy for development of the Patapsco Greenway. By seeing what is being done in neighboring jurisdictions, local planners and program managers may discover new means for their own efforts and may spark new ideas and cooperative arrangements.

Town of Mount Airy

The Town of Mount Airy has been providing open space amenities using funds received through Program Open Space. In addition to these planned parks, open space has been dedicated through the subdivision process. Any development project is required to have 10% of the tract in open space. In-lieu fees of 10% of the appraised value of the property must be paid when 10% of a tract's land area would be less than two acres, or when the Planning Commission determines it appropriate. The revenue generated from these fees is applied to town open space projects.

Development restrictions also prohibit development in environmentally sensitive areas, such as slopes over 30%, wetlands, and floodplains. A 50-foot undeveloped buffer is required along any stream, and a 25-foot protective buffer must extend from the upland limit of the wetlands. Water supply protection ordinances control

development in well recharge areas. If proposed development will decrease the recharge rate by more than 10%, or create a water demand on the site greater than the estimated groundwater recharge rate for the property, the plan must be reviewed by the Town Council, and stipulations must be met for adjusted densities and storm water management. All storm water management is designed for infiltration.

Carroll County

Most of Carroll County's environmental protection is done on a case by case basis. Development is discouraged within 100-year floodplains and requires a special exception or variance. Stream buffer widths vary with the size of the stream, and can be as much as 100 feet from the bank. This leaves corridors of open space along the stream, protecting the stream, its banks, and sensitive vegetation and wildlife from the effects of development, encroachment and siltation, and change in water quality and temperature.

The County is drafting forest conservation, water resource, and environmental ordinances. These ordinances will address forest cover, soils, setbacks from water bodies, steep slopes and wetlands. Environmental ordinances will specify review process on a case by case basis rather than putting forth universal standards.

Planned Unit Developments encourage clustering density on 25% of the site, near utility lines. Open space requirements are built into the PUD and cluster zones of the zoning ordinance. Landscaping ordinances require developers to plant one tree for

every residential unit developed but give credit for saving trees. For each 10-inch caliper tree saved, the county gives credit of one planting unit toward the required planting. Planting requirements include one street tree every 20 feet, screening of parking and dumpsters, and 8' planting strips to buffer residential areas.

Baltimore County

Baltimore County is working to prepare comprehensive plans for the protection of groundwater and forest resources. Regulations in place for the protection of streams and reservoirs, water quality, wetlands, and floodplains provide forest buffers along streams and building setbacks from forest buffers. Forest buffers extend 75 feet from the centerline of the stream on a first or second order stream, and 75 feet from the bank on higher order streams. Lands 25 feet beyond the 100-year floodplain or 25 feet from the wetland boundary must be included in the forest buffer. Whichever restriction is greater is binding. Buildings must be set back from the buffer - 35 feet for residential buildings, 25 feet for commercial and industrial buildings.

In areas of steep slopes and erodability, an evaluation of the site and proposed development must be prepared, as well as plans for any mitigation required. Any water pollution, erosion and sedimentation into stream channels, or degradation of aquatic and riparian habitat must be abated and corrected by the developer.

The Baltimore County Master Plan designates the area in the Western Sector, along the Patapsco River for resource conservation, agricultural conservation and

rural protection. To facilitate this, Baltimore County has set up Resource Conservation Zones in its zoning regulations. These zones were intended to preserve agricultural lands and protect prime and productive soils from inappropriate development, as well as protect groundwater reserves and surface water flows to the reservoirs and Chesapeake Bay. The RC 2 and RC 4 zones are the most protective. The RC 2 zone allows only one house per 50 acres. The RC 4, or Watershed Protection Zone, requires mandatory clustering on a maximum 30% of the land, leaving the remainder in conservancy land. Watershed protection areas are lands associated with any major stream or reservoir. If this land is already in agriculture, the 70% conservancy land must be placed in a permanent agricultural easement.

To accommodate the demand for rural residential development, the RC 5 zone was created. Most rural development will occur in these areas. Rural protection seeks to achieve balance of natural and rural features so as not to compromise the existing rural landscape and natural resources. The county will promote greenways in the required open space in the zone, open space requirements being 40% of the tract area to be developed.

Howard County

Howard County is adding open space and greenways through acquisition, zoning, subdivision, open space regulations and cooperation with private enterprise. The county is looking at recreational easements on privately owned lands, public/private partnerships, and working with BG & E and Colonial Gas Pipeline Company to put

trails in utility corridors.

The western portion of the county is less developed than the east but has experienced development pressures as well. Although growth has slowed due to the recession, county planners believe that tighter clustering will be necessary to protect open space as new development occurs. The area now has rural zoning with minimum lot sizes of three acres. With roads and infrastructure, this results in an average of one dwelling unit per 4.5 acres. Under the RC and RR zones, the county would encourage cluster development leaving the remaining land (65-75% of the tract) undeveloped.

The county has proposed a Density Exchange Option (DEO). The DEO Overlay District would allow residential density to be exchanged between parcels. Sending areas must be a minimum of 50 contiguous acres, made up of lots no less than 20 acres. Density may be exchanged at a rate no greater than one dwelling unit/3 gross acres, or one dwelling unit/5 gross acres, if cluster exchange option is used. Receiving areas would have a base density of one dwelling unit/5 gross acres, and a maximum density of one dwelling unit/2 gross acres.

Revised open space regulations will prescribe open space requirements based on the size of the development project. Inlieu fees would be substituted for projects where open space amenities may not be practical or appropriate. Revisions would also redefine open space requirements to exclude unusable fragmented green space, such as leftover parcels, buffer strips, parking lot islands, and space between dwelling units, from open space

calculations. Open space requirements vary from 5% to 20% of tract area, 50% of which must be usable land.

Other environmental regulations also protect the integrity of open space and greenways. Stream buffer guidelines prohibit any disturbance within 75 feet from the centerline of the stream, or from the stream bank for larger streams. No development is allowed within the 100-year floodplain, but this area may be included in open space dedication requirements. The county has enacted a tree preservation ordinance. Landscaping guidelines are being developed. Currently, all development proposals must include a landscape plan.

Howard County also has an active agricultural preservation program. Currently, 11,000 acres are protected, with 4,000 acres pending. This land is not open for recreational use, but rather, is dedicated to environmental and agricultural preservation. Howard County hopes to increase lands protected under this program to 20% of the county's 160,000 acres.

About 30,000 acres of land, or almost 20% of the county, is currently in open space, parks, recreation land, and specially protected environmental and agricultural areas.

Recreation & Parks	3%
State owned properties	6%
WSSC Property	2%
Columbia Association	2%
Agricultural Preservation	7%

With the pending 4,000 acres of agricultural preservation lands proposed in

the Howard County General Plan, the total open space will approach the county's goal of 25% of county land by the year 2000.

Anne Arundel County

Anne Arundel County protects sensitive areas and stream valleys and provides for open space and wildlife corridors through a variety of programs and regulations.

The county's Critical Area Program addresses tidal and non-tidal wetlands. habitats of threatened and endangered species, anadromous fish propagation waters, bird nesting sites, and riparian habitat. The critical area is defined as all land and water areas within 1,000 feet of tidal waters or wetlands. The county's program puts limits on growth and protects the natural environment through a variety of means. Development other than waterdependant facilities is prohibited within the 100-foot buffer from the mean high water line. Tree cutting is not allowed in habitat protection areas, and only loblolly pine and tulip poplar may be cleared within 50 feet of the mean high water line. Any cutting must be done in accordance with a forest management plan, a sediment control plan and a buffer management plan. Any planting in the buffer must be with native vegetation. The program specifies reforestation requirements and, when reforestation is not possible on-site, assesses a fee which goes to a critical area reforestation fund.

Regulations within the program restrict agricultural uses in critical areas and require soil conservation and water quality plans which must include provisions for the protection of existing habitat areas. All precautions must be taken to protect mining sites from contributing to pollution, including siltation, chemicals, waste, dusts and spoils. Special exception applications must include location of natural resources and reclamation and reforestation plans. Natural parks are to be designated for the protection of geological and biological resources. Also, any development proposed within critical areas must go through the subdivision review, building permit and grading permit processes with the site plan accompanied by a habitat assessment.

County zoning laws regulate development in other areas. In residential low density districts, only 20% of the site may be cleared. Any clearing beyond that must be replanted at 150%. Development is not allowed in the 100-year floodplain, and all structures must be set back 100 feet from perennial streams or the mean high water line, and 25 feet from the edge of non-tidal wetlands or 100-year floodplains. No lots may be platted in wetlands or floodplains and any disturbances must minimize alterations to surface or subsurface water flows into and out of existing wetlands.

The Anne Arundel County Code designates open space districts for the preservation of open areas for recreation, prevention of flood damage, and prevention of environmentally incompatible development and its costs. Public or private land used for recreation, lands in the natural drainage system, and lands designated "structural open space" by the general development plan are protected under the code. The code restricts the uses and structures allowed on the property.

Additionally, the code enumerates percentages of subdivision tract area to be dedicated as open space by the developer. The area required will be not less than 1,000 square feet and may be as much as 20%, depending on the density of development. In a planned unit development (PUD), the green space requirement is 25-55%, depending on the zone. Of this, 40-60% must be devoted to recreational space.

Recreational land may not have steep slopes, streams, lakes, watercourses, stormwater management areas, or floodplains in more than 25% of the area. At least 75% of the recreational land must be suitable for dry ground recreational use with less than 5% slope. No lots or buildings are allowed within the 100-year floodplain.

City of Baltimore

Baltimore's shoreline is protected under floodplain legislation, which prohibits habitable structures below the 100-year flood elevation. Development is allowed in the 100 foot critical area buffers if an offset fee of \$2.50/square foot (\$108,000/acre) is paid. This has allowed development around the Harbor, and the monies raised from fees are used to fund other open space projects and shoreline restoration endeavors, to offset the impact. Fees may be waived for dedicated public access easements. The Gwynns Falls/Middle Branch area has been designated by the city as a preferred location for the use of critical area offset funds.

Streams are also protected by floodplain legislation, which prohibits any

development within the floodway, and prohibit habitable structures below the 100-year flood elevation. Many floodplains were developed prior to the initiation of the regulatory program and these greenway opportunities are lost. In some cases, the city has been able to remove existing structures and reclaim flood areas with the assistance of the state's Flood Management Grant Program.

The Maryland Forest Conservation Act requires afforestation of parcels greater than 40,000 square feet to achieve 15% of the site coverage. The city uses regulation under this program and the Clean Water Act to control stormwater runoff and non-point source pollution.

Summary of Local Land Use and Environmental Regulatory Tools

Because the land use and other regulatory tools of each local political jurisdiction in the Patapsco watershed were developed largely independently of each other and in response to local circumstances (physical and political), and because they were in no cases developed with an eye to instituting greenways, they are difficult to compare to one another and to evaluate with respect to their ability to promote greenway implementation. All of the local governments have at least some of the tools in their arsenals which are considered most significant for greenways: open space dedication, floodplain regulation, natural stream buffer conservation, steep slope development exclusion, cluster provisions and transfer of development rights; no local government makes use of all of them.

Even where all local governments make use of a particular tool (such as floodplain regulation, which is required. under federal and state law to meet certain minimal requirements) approaches vary between jurisdictions; from prohibition of any development and a requirement for a floodplain conservancy in Anne Arundel. to a prohibition of habitable structures only in Baltimore City. And where most iurisdictions have a particular provision (such as a stream buffer requirement), the specifics (such as width, whether the buffer must be natural or forested or simply not built on) vary. Thus application of the "same" tool on two sides of the river could result in quite different greenway effects. Differences in the specifics can also lead to miscommunication among greenway participants and misunderstanding in the general public.

The degree to which land use and environmental regulation can contribute to greenway creation is clearly dependent upon how much of a particular jurisdiction remains to be developed subject to these regulations. In the Patapsco case, these approaches will have limited value for Baltimore City; in Anne Arundel County's Patapsco corridor, much of the land is also already developed. Carroll and Howard counties particularly, however, and to some extent, Baltimore County, will be able to use these tools to a greater extent to expand protection of their Patapsco Greenway systems.

FEDERAL GOVERNMENT

As noted previously, the Federal government does not presently play a major role as a land manager in the Patapsco corridor, in marked contrast to the state's other significant greenway, the Potomac. Only a few small parcels within the Patapsco Valley State Park are federally owned and managed. However, several federal agencies can provide funds or technical assistance important to creating or maintaining greenways.

National Park Service

The Land and Water Conservation
Fund administered by the National Park
Service (NPS) can provide funds for public
land acquisition and recreational
development for projects compatible with
the State's Open Space and Land
Preservation Plan. Several projects have
been developed with such funding
assistance in Patapsco Valley State Park
over the years. Local projects are also
eligible for financial aid. Total funds
under this program are limited annually,
about \$300,000 to \$500,000 is available for
Maryland projects under the Land and
Water Conservation Fund.

NPS also administers the National Wild & Scenic Rivers Program, and under its Rivers and Trails Conservation Assistance Program, it can provide technical assistance to state and local governments and interested citizens for greenways planning. Such assistance made possible many of the state's rivers assessments over the years and is currently helping to promote Frederick County's greenway planning effort.

National Oceanic and Atmospheric Administration, Department of Commerce

Through its Coastal Zone Management Grant program, the National Oceanic and

Atmospheric Administration (NOAA) can fund both planning and capital projects related to greenways. Such funding underwrote most of the state of Maryland's start-up of the greenways program and is assisting the Patapsco planning effort. Local governments as well as state agencies are eligible for funding for planning and implementation of greenways projects. Grants in Maryland are channeled through the Coastal and Watershed Resources Division of DNR's Tidewater Administration.

Some Coastal Zone money has also been spent on capital projects, including the 1991 construction of a segment of trail in the lower portion of Patapsco Valley State Park. Projects eligible for funding include those which promote public access to beaches, shoreline areas, or coastal waters, provide environmental education, or preserve, restore, or enhance coastal areas of significant natural resource value. Like the planning grants, Section 306A grants for capital projects are channeled through the Coastal and Watershed Resources Division. Construction costs associated with such projects are generally not to exceed \$50,000 in federal grant expenditures. Among the types of projects funded with 306A funds are paths, boardwalks, observation areas, and the rehabilitation of historic structures.

Department of Agriculture

Several programs under the Department of Agriculture have potential implications for greenways. The Rural Clean Water Program develops contracts with landowners to share costs to implement Best Management Practices (BMP) under an approved plan. BMP's serve to protect the land from erosion, and streams from siltation and runoff of fertilizers and pesticides. The Small Watershed Management Program provides technical assistance to states and localities for agricultural water management projects which may affect wetlands. Finally, the Agriculture Stabilization and Conservation Service, Conservation and Environmental Protection Division contracts with landowners to preserve wetlands determined important for nesting and breeding of migratory waterfowl. It works to preserve the habitat of fish and wildlife and promotes management and planning for its improvement, and increases recreation resources through contracts and easements with landowners.

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) is the federal government's flood disaster management agency, administering the National Flood Insurance Program. Besides setting the rules for obtaining flood insurance, under which future floodplain development is restricted by locally adopted ordinances, this program has a provision, Section 1362, allowing the public purchase of severely flood-damaged properties and their removal from the floodplain. Less flexible than Maryland's flood management grant program, FEMA's provisions apply only

after a flood. Like the state's program, FEMA's purchase is only from willing sellers. Despite these limitations, however, the program can provide another mechanism for undoing past mistakes in floodplain development and helping to restore a natural greenway in the floodplain.

Environmental Protection Agency

The Environmental Protection Agency, in partnership with federal, state and local governments, is responsible for restoring and maintaining the chemical, physical and biological integrity of the nation's waters. Because of the value of wetlands as an integral part of those waters, EPA is also charged with protecting wetland resources.

EPA recognizes that an effective program to protect our nation's wetlands and other natural areas must include cooperation with federal, state, and local agencies; developers; environmental groups; the scientific community; landowners and others.

By assisting states, local governments and private groups, the EPA Wetlands Program, through headquarters and ten regional offices, fosters and supports wetland and watershed protection throughout the United States. Assistance includes information on watershed and river corridor protection approaches; financial assistance; comprehensive ecological planning and water quality management, and scientific information on wetlands and aquatic ecosystems.

Information about EPA's programs and assistance is available through its Wetlands Protection Hotline, at 1-800-832-7828.

NON-PROFIT ORGANIZATIONS AND LAND TRUSTS

Non-profit organizations can play an important role in protecting greenways. National and regional organizations such as the Nature Conservancy, Chesapeake Bay Foundation, Natural Lands Trust, Trust for Public Lands, and The Conservation Fund have all played important greenway roles elsewhere in Maryland and are among the institutional resources to be considered in the Patapsco as well. In some cases, such organizations are already contributing through funding, technical assistance, or educational endeavors.

Non-profit land conservation organizations frequently acquire and manage land for preservation and conservation purposes. Because they can often move much more quickly to acquire important properties than can a public agency, private non-profits also sometimes purchase land on behalf of the state or a local government, subsequently selling it to a public agency when funds or authorization become available. In some cases, a private non-profit organization may engage in a "limited development" project, buying substantial acreage, retaining or turning over to a public body. the portion most significant for greenway protection and reselling the rest to private interests for development subject to strict controls.

Because private non-profit conservation organizations are tax-exempt and can offer substantial tax benefits to property owners willing to sell land, these organizations can often acquire property at less than market value. Use of such groups as intermediaries in an acquisition can thus be attractive financially to public agencies.

Land trusts are organizations specifically established to receive easements and/or fee title to important properties for conservation purposes.

Donations of property easements or title to such organizations can be attractive to private property owners because of the tax advantages offered. The use of easements to protect parts of the greenway corridor is a valuable tool in that it retains private ownership and use of the property, albeit at reduced property value and thus tax revenue, while conserving important greenway benefits to wildlife, aesthetics and water quality. This technique is particularly appropriate where public access is not contemplated.

In addition to holding easements itself, the Maryland Environmental Trust and the Chesapeake Bay Foundation have formed the Local Land Trust Assistance Program to encourage the formation of local land trusts, provide technical assistance and legal services, and provide training in land conservation techniques and organization.

Local land trusts presently have been established in the Patapsco watershed in the City of Baltimore, Baltimore County, Carroll County and Howard County. Formation of such organizations in the remaining jurisdictions in the watershed can be an important step in establishing greenway networks, especially at the neighborhood level.

The Rails-to-Trails Conservancy (RTC) is a non-profit organization created in 1985, that works to convert abandoned railroad rights-of-way into trails for public use. Located in Washington, D.C., the RTC provides assistance to citizen groups, public agencies, railroads, and others who wish to convert an abandoned rail line into a trail. According to the RTC, over 3,000 miles of track are being abandoned every year.

Through its nationwide network of contacts, the RTC notifies interested parties of upcoming abandonments, assists public and private agencies in following proper legal procedures, and publicizes rails-to-trails issues throughout the country. At the national level, the RTC works for funding programs and simplified regulations to promote rail-trail conversions.

The RTC publishes a quarterly newsletter, *Trailblazer*, a legal manual for citizens and other publications. The RTC is supported by memberships and contributions. A contact for the RTC is listed in the appendix.

Maryland Save Our Streams has been a leading advocate for the protection and restoration of Maryland's rivers and streams. The organization works with citizens to help solve water quality problems and eliminate sources of pollutants to local waterways and the Chesapeake Bay. Save our Streams works in the areas of non-point source pollution, sediment control, stormwater management and environmental education. Its primary program has been the Adopt-A-Stream program, which involves local citizens in stewardship and monitoring of creeks and

streams, to improve water quality and enhance appreciation of our waterways.

Save Our Streams has undertaken a number of projects in the Patapsco Watershed. In 1990, they organized a cleanup of the Avalon section of Patapsco State Park and established a program with a local firm, RESCO, which adopted a section of the Patapsco River. RESCO is raising fish and releasing perch into the river each fall as part of this project.

In 1992, activities included a stream survey of Stony Creek in Anne Arundel County. Volunteers examined the shoreline and identified potential pollution problems. Save Our Streams is conducting an ongoing citizen education campaign in the Sawmill Creek area, involving workshops and area clean-ups. In addition, Save Our Stream volunteers have conducted clean-ups in the Six Coves area east of Baltimore, in Baltimore County. Over 120 scouts worked to clean up Chink Creek on Earth Day as part of this effort.

The Chesapeake Bay Foundation (CBF), is working to save the Bay through Environmental Education, Environmental Defense, and Lands programs. Education programs bring students and teachers to the Bay in canoes, workboats and skipjacks for hands on experience in "floating classrooms". The Environmental Defense Program investigates and monitors conditions of the Chesapeake Bay and the Lands Program advocates environmentally sound growth management and land use planning throughout the Bay watershed. CBF also manages land for habitat preservation and water quality improvement.

THE PRIVATE SECTOR

Privately owned lands play an important role in the greenway effort. It is impossible for government to work entirely on its own to protect important linkage areas. Even if they wanted to, state and local agencies could not afford to acquire all the land in greenway corridors. Many private property owners are devoted to protecting the resource values of their lands for their own and their children's enjoyment. In fact, much of the protection in the Patapsco River Valley is the result of the efforts of private citizens. Voluntary efforts to protect and enhance the resource values on private lands, and provision of technical assistance to private owners desirous of greenway participation, are both important elements in greenway implementation.

Inclusion of private land in a designated greenway does not necessarily mean that public access is allowed. A greenway can be available only to the owner, as in a wide, wooded stream buffer that is preserved on agricultural land, or to residents of particular communities where a homeowners' group retains title to some lands designated as open space or for recreational uses. Even with no access, private greenway elements are important for stream protection, wildlife habitat and, in urban areas, for visual relief from pavement and buildings. Examples of privately-owned components which could be linked into a greenway network include cemeteries, agricultural buffers, private school and college campuses, industrial park open spaces, conservation lands, and undeveloped floodplains, which may be owned and maintained by community associations or by adjacent land owners.

Rights-of-way of private or quasipublic utilities--electric power, gas, water or sewer -- may offer particular greenway connection opportunities, sometimes even serving as trail routes. For example, in the Lower Patapsco a sewer line serves as the route for part of the planned trail from Middle Branch through Patapsco Valley State Park. In some cases utilities do not own their rights-of-way, making public use problematic. Also clouding the issue of public trails on utility rights-of-way are questions of liability, maintenance and security.

Private homeowners associations and community groups often support greenways by donating the time and materials to community beautification and recreation projects. Such endeavors have included planting of neighborhood gardens, adopting maintenance of sections of streams, or installation of play areas. Community organizations are important in greenway development, engaging residents in protection of their neighborhoods and the natural environment. Participation in greenway and ecology programs fosters a sense of community, and environmental awareness and sensitivity.

The Maryland Greenways Commission's 1990 Report to the Governor suggested several approaches to increasing private cooperation in greenway establishment.

◆ As incentive to private groups to open their land to recreational or wildlife management uses, government should consider providing liability, security, and public safety coverage and technical expertise in trail building, maintenance, and wildlife management.

- ◆ The Commission should explore incentives to encourage wildlife enhancement on agricultural land.
- ◆ The state should provide recognition to those community groups or private landowners who dedicate their land to enhance the greenway network.
- Alliances with private corporations should be set up to protect greenway corridors through land reclamation on mining sites.
- Business and industry should be encouraged to dedicate lands for greenways.

In general, little work has been done to date to promote these approaches, in the Patapsco or elsewhere in the state. As Patapsco Greenway planning progresses toward implementation, increasing the participation of the private sector will become more and more important.

CONCLUSION

The Patapsco River Valley, including the North Branch, South Branch, mainstem and several major tributaries, represents the spine of an important regional greenway system in the Baltimore Metropolitan area. Virtually all of the mainstem and significant portions of the North Branch and South Branch closest to major urban development are currently retained for public open space use, primarily by the Maryland Department of Natural Resources, and are readily recognized as a greenway, although portions of the lower valley are degraded by past human activity. Lands along the South Branch above the Town of Sykesville, the North Branch above Liberty Reservoir, and the West Branch, East Branch and numerous lesser tributaries, are largely privately owned. Although in some cases farming practices have resulted in adverse impacts, these lands often retain high natural resource value and have remained comparatively undisturbed because of their relative remoteness from urban centers.

Two general opportunity areas for greenway expansion and improvement are readily identifiable. In the lower Patapsco, restoration of degraded state park properties could provide both environmental and recreational benefits. In more remote headwater segments of the Patapsco and its tributaries there are multiple opportunities to develop protected greenways, in part through cooperative efforts with private landowners or developers, in part through careful application of existing or refined environmental protection regulations, and in part through selective public acquisition.

The Maryland Department of Natural Resources, as a major landowner in the valley, has until now taken the lead in land preservation efforts, which have focused on public ownership--specifically Patapsco Valley State Park--as the primary means of protection. As greenway planning becomes more and more a local endeavor, other partners in the effort can be expected to assume leadership in planning and implementing additional protective measures. And in a time of severe public budget constraint and growing private sector interest in land conservation, tools other than public acquisition can be expected to play a larger role. Cooperative efforts between public agencies and private landowners, perhaps utilizing some of the technical and financial assistance programs described above, offer increasing potential for future greenway protection.

This report is the first step in the process to coordinate efforts for the implementation of a comprehensive greenway plan for the Patapsco River Valley. As the necessary foundation for subsequent planning steps, it provides an assessment of the natural resources in the stream valley. It also describes the wide variety of active programs of local governments to extend their open space and greenway networks, which are in many cases linked to the state park system in the valley. What has been lacking until now has been an overall framework for the implementation of local (public and private) protective measures and a mechanism to insure coordination between these actions and the State's program for Patapsco Valley State Park.

The report will provide the background and reference material needed for the Patapsco Greenway Advisory Committee to begin the next phase of planning for the Patapsco

Greenway. The committee will meet during the summer to review what has been done and identify and develop any additional resources needed to formulate an action plan.

The action plan will be the culmination of a day-long charette planned for September, 1992. The charette will be conducted by DNR and members of the Patapsco Greenway Advisory Committee, and a broad selection of representatives from relevant counties will be invited to participate. The goals of the charette will be to be identify an overall coordination plan and to define focus areas to be targeted for specific action. The charette should result in a clear understanding of the future roles and responsibilities of all partners in this effort, including DNR.

Following an intensive second phase of planning over the next few months, which will see formulation of preliminary concepts for greenway protection, in part by brainstorming with local and private greenway interests in the region, DNR will assume a less leading role in the Patapsco. This second phase will result in an agreed-on vision of the shape, use and benefits of the greenway, giving direction for future greenway protection efforts and recreational development. It will also result in a clear understanding of the future roles of all the partners in the effort, including DNR as a major landowner and provider of recreational opportunity.

A designated greenway along the Patapsco River can do much for the preservation and restoration of the natural environment and at the same time provide recreational opportunities to a large and diverse population. The Baltimore Metropolitan Region is home to approximately one-half of Maryland's population. Establishment of greenways here can bring an appreciation of nature to the urban dweller and accessibility to cultural attractions to people in suburban and rural areas, all by means of natural connectors. Ultimately, greenways can be a unifying element, connecting residential, employment, recreational, and cultural areas. This study presents the start.

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